SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT
and SECTION 4(f)/6(f) EVALUATION
SR 520 BRIDGE REPLACEMENT AND HOV PROGRAM

JANUARY 2010

SR 520, I-5 to Medina: Bridge Replacement and HOV Project

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Executive Summary

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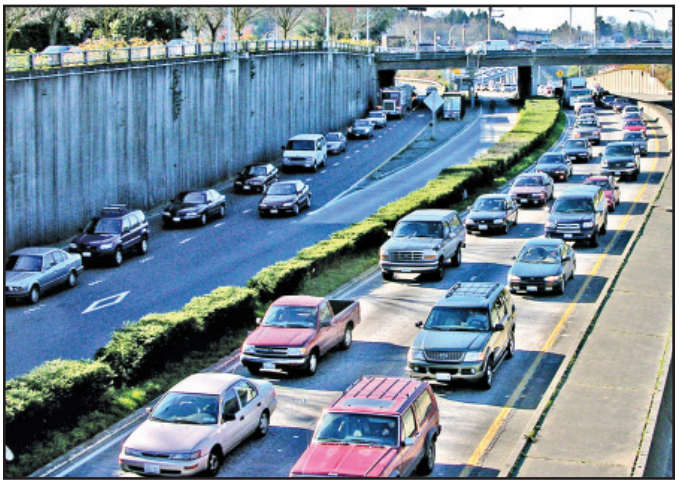
Introduction and project overview

State Route (SR) 520 is a critical link connecting the major population and employment centers of the Puget Sound region on either side of Lake Washington. The floating span of the Evergreen Point Bridge, opened in 1963, now carries approximately 115,000 vehicles per day across the lake, providing east-west access for commuters, freight, transit, and general-purpose traffic. The aging bridge is vulnerable to failure in a severe windstorm; fixed bridges along the corridor do not meet current seismic standards and could collapse in an earthquake. In addition, the corridor currently carries nearly twice as many vehicles as it was originally designed for, resulting in extended congestion and impaired mobility. The uninterrupted movement of people and goods across SR 520 and the floating bridge is essential to the region's economic vitality and quality of life.

What is the purpose of this document?

This document is an Executive Summary of the Supplemental Draft Environmental Impact Statement (EIS) prepared for the SR 520, Interstate 5 (I-5) to Medina: Bridge Replacement and High Occupancy Vehicle (HOV) Project (SR 520, I-5 to Medina project). The Supplemental Draft EIS was issued on January 22, 2010, by the Washington State Department of Transportation (WSDOT) and the Federal Highway Administration (FHWA). As a summary, this document provides a high level overview of the project, including the project description, project benefits, and key findings. This summary is not intended to provide all the information contained within the Supplemental Draft EIS, and the reader should refer to the complete Supplemental Draft EIS for details on information provided herein. Exhibit numbers found in this document correspond with the exhibits found in the full Supplemental Draft EIS (see the enclosed CD with electronic copies of the Supplemental Draft EIS and appendices).



Ramp metering at Montlake on-ramp and freeway congestion

Why is this Supplemental Draft EIS being prepared?

According to the National Environmental Policy Act (NEPA), and similar requirements in the State Environmental Policy Act (SEPA), an agency must prepare a Supplemental Draft EIS when:

- The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or
- There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. (40 Code of Federal Regulations (CFR), Section 1502.9(c)(1))

The Supplemental Draft EIS presents information about the project to inform citizens about the potential effects of project choices and to assist decision-makers in considering how the project should proceed. It builds on the work of the 2006 Draft EIS by evaluating a new set of 6-Lane Alternative design options—developed by a legislatively-appointed mediation group discussed in more detail on page 23—for the portion of SR 520 in Seattle. The Supplemental Draft EIS compares the effects of building each of the new 6-Lane Alternative design options with the effects of a No Build Alternative. Both the positive and negative environmental consequences are identified.

Preparing a Supplemental Draft EIS allows new design options developed through the mediation process, which are substantially different from those studied in the 2006 Draft EIS, to be evaluated fully before a decision is made on a preferred alternative and design option. This mediation process is described in more detail later in the summary. In addition, the Supplemental Draft EIS contains additional design detail and analysis—including additional information on construction effects, mitigation measures, and transit operations—that was requested in public, agency, and tribal comments on the Draft EIS. Including this information in the Supplemental Draft EIS allows agencies, tribes, and the public to review and comment on it prior to a final decision.

Although WSDOT will not formally respond to Draft EIS comments until the Final EIS, it is important to note that much of the content of the Supplemental Draft EIS was generated in response to feedback received on the Draft EIS. The new design options are the result of a public process created to address concerns about the original range of alternatives and design options. WSDOT reviewed all public, agency, and tribal comments while preparing the Supplemental Draft EIS analysis and has provided additional information and clarification wherever possible. The Supplemental Draft EIS contains additional detail on construction techniques and on mitigation measures, which were among the key points raised by resource agencies and tribes in their comments on the draft. More detailed analysis of transit has been added to also respond to comments by agencies.

What is the SR 520, I-5 to Medina: Bridge Replacement and HOV Project?

The SR 520, I-5 to Medina project would improve safety and mobility in the SR 520 corridor by replacing the vulnerable bridges and adding HOV lanes to move people more efficiently in transit and carpools. It would ensure the continued availability of SR 520 as a key corridor for transportation and commerce. It is designated as a strategic project by the Puget Sound Regional Council and is included in WSDOT's 2009-2012 Statewide Transportation Improvement Program.

The SR 520, I-5 to Medina project is located at the western end of the SR 520 corridor (see map below). It begins at SR 520's interchange with I-5, the main north-south artery through Seattle, and ends at Evergreen Point Road in Medina, east of Lake Washington. Today, the 4-mile-long project corridor includes the interchange at Montlake Boulevard and ramps connecting to Lake Washington Boulevard, both in Seattle. Prior to 2008, the project also included the portion of SR 520 from Evergreen Point Road to just east of I-405, which is now part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project.

Exhibit 1-1. Project Vicinity Map

Why is this project unique?

The 47-year-old Evergreen Point Bridge is fast becoming a victim of age and obsolescence. Despite the expansion of the Lake Washington Interstate 90 (I-90) bridge crossing to the south in 1989, the Evergreen Point Bridge and the adjoining stretches of SR 520 are choked with traffic for hours every weekday. Simply stated, more people want to use the highway than it can accommodate. Narrow shoulders and the lack of an HOV lane mean that a single breakdown can snarl traffic for hours, while buses and carpools creep along with general-purpose traffic in the resulting congestion. Meanwhile, strong winds and high waves threaten the integrity of the floating portion of the bridge and sometimes force its closure. In addition, the Portage Bay Bridge and both the west and east approaches to the Evergreen Point Bridge are supported by hollow columns that are especially vulnerable to damage in an earthquake.

For these reasons, the SR 520, I-5 to Medina project is one of the region's highest transportation priorities. Traffic safety and reliability need to be improved, and the vulnerable structures built in the 1960s must be replaced. Furthermore, travel in the region must be made more efficient by providing better transit options in the SR 520 corridor. Neighborhoods and the region as a whole must be better served by reliable infrastructure, yet the built and natural environment must be protected as much as possible from the potential effects of a major transportation corridor.

What is the project purpose?

In 2000, the Trans-Lake Washington Study Committee developed the statement of purpose, which has guided the environmental review process since that time:

> The purpose of the project is to improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.

The statement of purpose—part of a longer purpose and need statement also adopted in 2000—has helped the project team develop and evaluate alternatives for the EIS analysis by defining the objectives that the alternatives must meet. Although the project limits have changed since the original statement was adopted, the project's purpose remains the same.

Project purpose

The purpose of the SR 520, I-5 to Medina: Bridge Replacement and HOV Project is to improve mobility for people and goods across Lake Washington within the SR 520 corridor from Seattle to Redmond in a manner that is safe, reliable, and cost-effective, while avoiding, minimizing, and/or mitigating impacts on affected neighborhoods and the environment.

Why is the project needed now?

The Evergreen Point Bridge is a critical component of the Puget Sound region's transportation infrastructure. It is one of only two connections across Lake Washington that link urban centers in Seattle and the Eastside. The SR 520, I-5 to Medina project addresses two key issues facing the SR 520 corridor:

1) Bridge structures that are vulnerable to catastrophic failure; and

2) Worsening traffic levels and congestion due to growth in jobs and housing over the last two decades.

Vulnerable to catastrophic failure

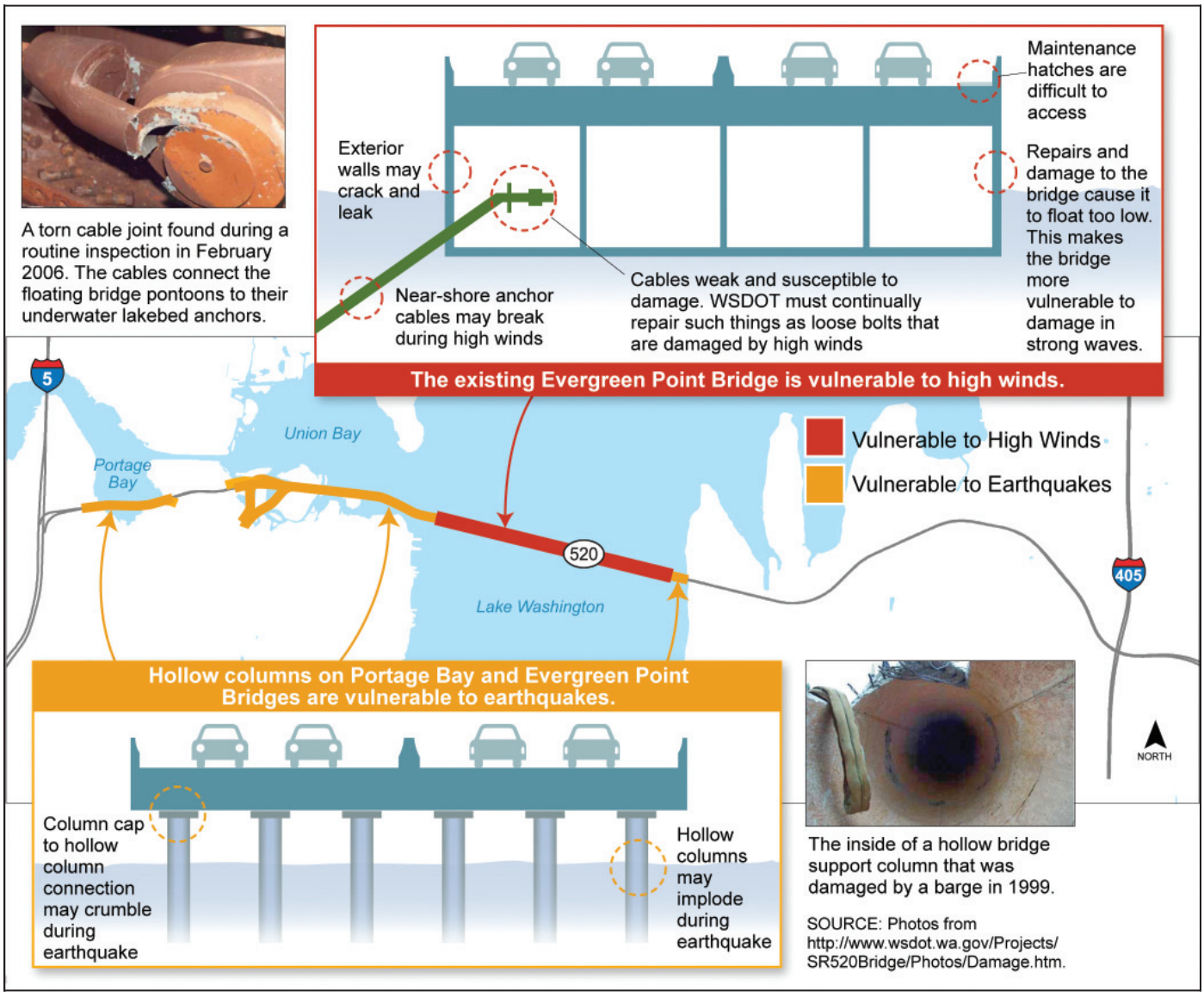
The Evergreen Point Bridge and its approaches are in danger of structural failure. Recent WSDOT studies have demonstrated that the floating span of the Evergreen Point Bridge is highly vulnerable to windstorms, while the Portage Bay Bridge and the east and west approaches to the Evergreen Point Bridge are vulnerable to earthquakes. In 1999, WSDOT estimated the remaining service life of the floating portion of the Evergreen Point Bridge to be 20 to 25 years, based on its structural condition and the likelihood of severe windstorms. Its life expectancy now is only about 10 to 15 years.

Vulnerable to windstorms

The span was originally designed for a sustained wind speed of 57.5 miles per hour (mph). In 1999, WSDOT rehabilitated the bridge to allow it to withstand sustained winds up to 77 mph. This still falls well short of the current design standard of 92 mph. Moreover, some bridge mechanisms have been damaged in recent storms. The floating pontoons currently float about 1 foot lower than originally designed, increasing the likelihood of waves breaking onto the bridge deck. Cracks in the structure leak water that WSDOT must pump out on a regular basis. The probability that the bridge will sustain serious structural damage over the next 15 years is extremely high. To bring the Evergreen Point Bridge up to current design standards and eliminate the risk of its catastrophic failure, the existing span must be completely replaced. Exhibit 1-2 shows the vulnerable sections of SR 520.

Evergreen Point bridge during a storm

Exhibit 1-2. Points along SR 520 vulnerable to earthquake and windstorms



Vulnerable to earthquakes

The ever-present possibility of an earthquake in the Seattle area poses additional risks to other bridges in the SR 520 corridor. The columns of the Portage Bay Bridge and both the west and east approaches to the Evergreen Point Bridge are hollow and do not meet current seismic design standards. Hollow-core columns are difficult and costly to retrofit to today's accepted seismic protection levels; WSDOT studies indicate that such retrofitting would cost as much as building new structures, and would have similar environmental impacts. WSDOT estimates that over the next 50 years, there is a 20 percent chance of serious damage to these structures in an earthquake.

Congested, unreliable, and does not encourage maximum transit and carpool use

A second key reason for implementing this project now is the severe traffic congestion in the SR 520 corridor, which was the reason for initiating the original Trans-Lake Washington Study in 1998. The traffic demand in both directions exceeds the highway's capacity, creating several hours of congestion every weekday. The corridor was not built to handle as many vehicles as currently want to use it. All of these vehicles result in frequent breakdown of the traffic flow and long backups of vehicles traveling at very slow speeds.

A number of factors have contributed to today's traffic congestion on SR 520. One factor is the pattern of population growth and the changing location of jobs in the project area since the highway opened in 1963. The new crossing of Lake Washington made it much easier for people to live in Eastside communities and work in Seattle, increasing the number of westbound vehicles across the Evergreen Point Bridge in the morning and eastbound in the evening. Meanwhile, some of these Eastside communities began to develop their own commercial and employment centers, eventually leading to substantial growth of "reverse commute" traffic. Today, seven times more vehicles cross SR 520 each day than when the bridge first opened in 1963, and there is no longer a reverse commute: traffic during peak hours is nearly equal in each direction.

Beyond the number of people and cars, another important factor causing today's congestion is the design of the Evergreen Point Bridge. By today's engineering standards, the bridge is too narrow. The narrow shoulders provide no room for vehicles to pull over after an accident or breakdown. Instead, disabled vehicles must stay in the through-lane and block other traffic, immediately rendering a full lane of traffic unusable. This slows down traffic and impedes emergency vehicle response. In addition, the westbound HOV lane on the Eastside ends at the bridge.

The west highrise

Heavy traffic on SR 520

This creates congestion as westbound HOV traffic is forced to merge with general-purpose traffic.

Together, growth and physical limitations will make the future traffic situation on SR 520 worse if the corridor is not improved. Under average evening peak-hour conditions today, a single-occupant vehicle traveling westbound takes approximately 32 minutes to travel SR 520 from SR 202 in Redmond to I-5 in Seattle - a distance of about 13 miles. By 2030, if the project is not built, the same trip will take 49 minutes. This makes it imperative that commuters be provided with travel choices that allow them to avoid driving alone, and that the proposed project be built to support increased use of transit and HOVs.

Traffic congestion is more than an inconvenience for drivers. It also impairs the regional economy and the quality of our lives and communities. Delays increase business costs, discourage growth, and create disincentives for businesses to locate in the region. Congestion generates pollutants from idling vehicles, which are much less efficient than vehicles operating at higher speeds.

What would the project accomplish?

The SR 520, I-5 to Medina project would improve safety and mobility in the SR 520 corridor by improving SR 520 from I-5 to Evergreen Point Road. Under all design options, the project would include the following:

- A new Evergreen Point Bridge, designed to current standards for wind and wave resistance.
- New Portage Bay and west and east approach bridges designed to current seismic standards.
- Four general-purpose lanes and two HOV lanes, providing increased mobility and reliability for transit and carpools as well as for general-purpose vehicles.
- Wider shoulders and improved curves for greater safety and improved reliability.
- Landscaped lids over sections of the highway to reconnect neighborhoods.
- A regional bicycle/pedestrian path across Lake Washington with connections to existing bicycle and pedestrian facilities.
- Stormwater treatment to improve the quality of runoff from SR 520, which is currently not treated.
- Noise reduction features, which could include noise walls and/or quieter, rubberized asphalt pavement.

What would happen if the project were not built?

If the project were not built, the section of SR 520 between I-5 and Evergreen Point Road would not be improved, and these critical needs would not be met:

- The risk of bridge failure in a storm or earthquake would increase as the structures continued to age, with consequences ranging from severe traffic congestion to loss of life. As the floating bridge becomes more fragile, it would require more frequent closures to protect its components from damage.
- Planned growth in the project area over time would cause continued growth in traffic volumes on SR 520, increasing congestion and raising the potential economic and social cost of traffic closures and/or bridge failures.
- Transit vehicles and carpools would remain in congested general-purpose lanes, increasing travel time, reducing reliability, and discouraging commuters from choosing transit.
- The facility's narrow shoulders would continue to result in blocked lanes and long delays when accidents occur.
- Without lids, SR 520 would continue to serve as a barrier between neighborhoods.
- Pedestrians and bicyclists would remain limited to I-90 as a choice for crossing Lake Washington.
- Stormwater discharging from SR 520 into Portage Bay and Lake Washington would remain untreated.

What other projects are included in the SR 520 Program?

The 2006 Draft EIS evaluated the SR 520 corridor from I-5 in Seattle to 108th Avenue NE in Bellevue as a single project. Since that time, in response to changing conditions, WSDOT has worked with FHWA to develop new projects within the context of an overall SR 520 corridor program. Each project has a separate purpose and need; each provides independent benefit to the region. The projects can be summarized as follows:

- The SR 520 **Pontoon Construction Project** would construct new pontoons that would be used to restore the existing traffic capacity of the Evergreen Point Bridge in the event of a catastrophic failure. Having pontoons ready for such a catastrophic failure would allow the bridge to be restored several years faster than if the pontoons were constructed in response to a disaster. This would, in turn, reduce adverse effects on traffic and the regional economy. WSDOT is preparing a Draft EIS, scheduled for release in spring 2010, to evaluate the effects of building these pontoons and storing them until they are needed. Two possible pontoon construction sites in Grays Harbor will be analyzed in the Draft EIS. WSDOT would use an existing facility in Tacoma to supplement pontoon construction. Using the Concrete Technology Corporation, Inc., facility in addition to the new facility in Grays Harbor may expedite pontoon construction.
- The SR 520, **Medina to SR 202: Eastside Transit and HOV Project** was developed in 2008 to improve transit travel time and reliability in response to strong growth in jobs, housing, and transit demand east of Lake Washington. This project would complete the SR 520 HOV system from Evergreen Point Road in Medina to SR 202 in Redmond; build direct transit access from 108th Avenue NE; and provide community and environmental benefits, including lids, noise walls, a bicycle/pedestrian path, and stream and habitat enhancements. These improvements would support existing demand and planned improvements in transit use, and would enhance safety by improving HOV lane operations. WSDOT and FHWA published an Environmental Assessment to evaluate the effects of the SR 520, Medina to SR 202 project in December 2009. WSDOT anticipates completing the environmental process and permitting in spring 2010, with construction to begin later in 2010 pending funding availability.
- In spring 2011, WSDOT will begin tolling on SR 520 through the **Lake Washington Congestion Management Project**. Under this project, the SR 520 corridor will use all-electronic tolling to relieve existing congestion, meaning that there will be no toll booths at all. Drivers on SR 520 will be able to cross without stopping to pay, allowing traffic to flow at normal highway speeds. This project is part of the Lake Washington Urban Partnership, a collaborative effort between WSDOT, King County, the Puget Sound Regional Council, and FHWA to explore innovative ways to help manage congestion on SR 520. WSDOT prepared an Environmental Assessment on this project and received a Finding of No Significant Impact (FONSI) in June 2009.

When the SR 520, Medina to SR 202 portion of SR 520 became an independent project, the limits of the SR 520 Bridge Replacement and HOV Project changed. It is now the SR 520, I-5 to Medina project, with its limits set at I-5 on the west and Evergreen Point Road on the east.

The SR 520 Bridge Replacement and HOV Program

The SR 520 program projects are:

- I-5 to Medina: Bridge Replacement and HOV Project
- Medina to SR 202: Eastside Transit and HOV Project
- Pontoon Construction Project
- Lake Washington Congestion Management Project

Project alternatives and design options

What project alternatives and design options are evaluated in the Supplemental Draft EIS?

The SR 520, I-5 to Medina project Supplemental Draft EIS evaluates the following two alternatives and three 6-Lane Alternative design options:

- No Build Alternative.
- 6-Lane Alternative with the following design options that were developed in 2008 through a mediation process (described later in this document):
  - Option A, which would replace the existing Montlake interchange with a new interchange in a similar configuration, add a new drawbridge parallel to the existing Montlake Bridge, and an option for removal of the existing Lake Washington Boulevard ramps.
  - Option K, which would replace the existing Montlake interchange and Lake Washington Boulevard ramps with a new depressed interchange at the Montlake shoreline and a tunnel beneath the Montlake Cut to an intersection at Pacific Street.
  - Option L, which would replace the existing Montlake interchange and Lake Washington Boulevard ramps with a new elevated interchange at the Montlake shoreline and a drawbridge over the east end of the Montlake Cut to an intersection at Pacific Street.

These alternatives and design options are described in more detail below.

What are the project alternatives?

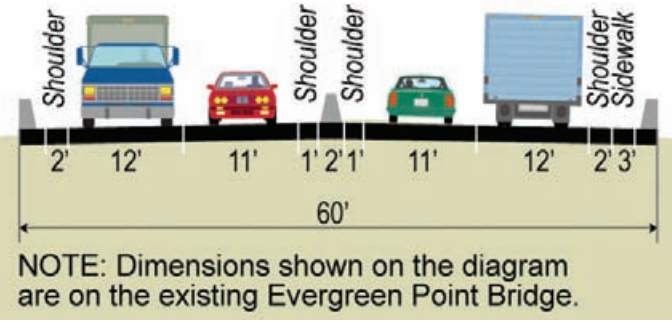
The Supplemental Draft EIS evaluates a No Build Alternative and a 6-Lane Alternative, both of which are described below.

What is the No Build Alternative?

The No Build Alternative assumes that, other than normal maintenance and repair activities, the SR 520 corridor between I-5 and Evergreen Point Road would remain exactly the same as it is today. SR 520 would continue to operate as a four-lane highway with nonstandard shoulders and without a bicycle/pedestrian path (Exhibit 1-4). No new facilities would be added and none would be removed, including the unused R.H. Thomson Expressway ramps near the Washington Park Arboretum. Stormwater runoff from the existing roadway surface would continue to discharge to surface waters without treatment. WSDOT would continue to manage traffic using its existing transportation demand management and intelligent transportation system strategies.

The remaining design life of the Evergreen Point Bridge is currently estimated at just 10 to 15 years, and a severe storm could cause it to fail even sooner. The Portage Bay and west approach bridges are also vulnerable to collapse in a severe earthquake. For these reasons, the No Build Alternative is inconsistent with WSDOT's standards for safety and reliability. Given the vulnerabilities of the existing SR 520 bridges, the No Build Alternative is not a likely scenario; however, it provides a set of baseline conditions against which the expected effects of the 6-Lane Alternative and design options can be compared.

Exhibit 1-4. No Build Alternative roadway cross-section



Existing Evergreen Point Bridge

What is the 6-Lane Alternative?

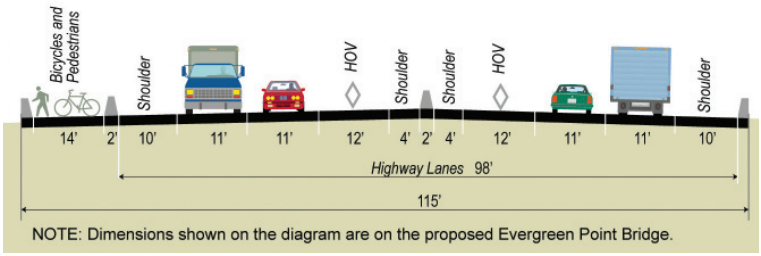
The 6-Lane Alternative would widen the SR 520 corridor to six lanes (Exhibit 1-5) from I-5 in Seattle to Evergreen Point Road in Medina. It would replace the vulnerable Evergreen Point Bridge, Portage Bay Bridge, and west approach with new structures. The 6-Lane Alternative would complete the

regional HOV lane system across SR 520, as called for in regional and local transportation plans. Exhibit 1-6 shows the project limits and identifies the portions of the project within three geographic study areas: Seattle, Lake Washington, and the Eastside. Within these limits, SR 520 would be six lanes (two 11-foot-wide outer general-purpose lanes and one 12-foot-wide inside HOV lane in each direction), with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders.

The cross-section of the 6-Lane Alternative is narrower than that in the Draft EIS, in response to concerns from the public, agencies, and tribes about its overall width. The 6-Lane Alternative also includes the following features, each of which is described in more detail below:

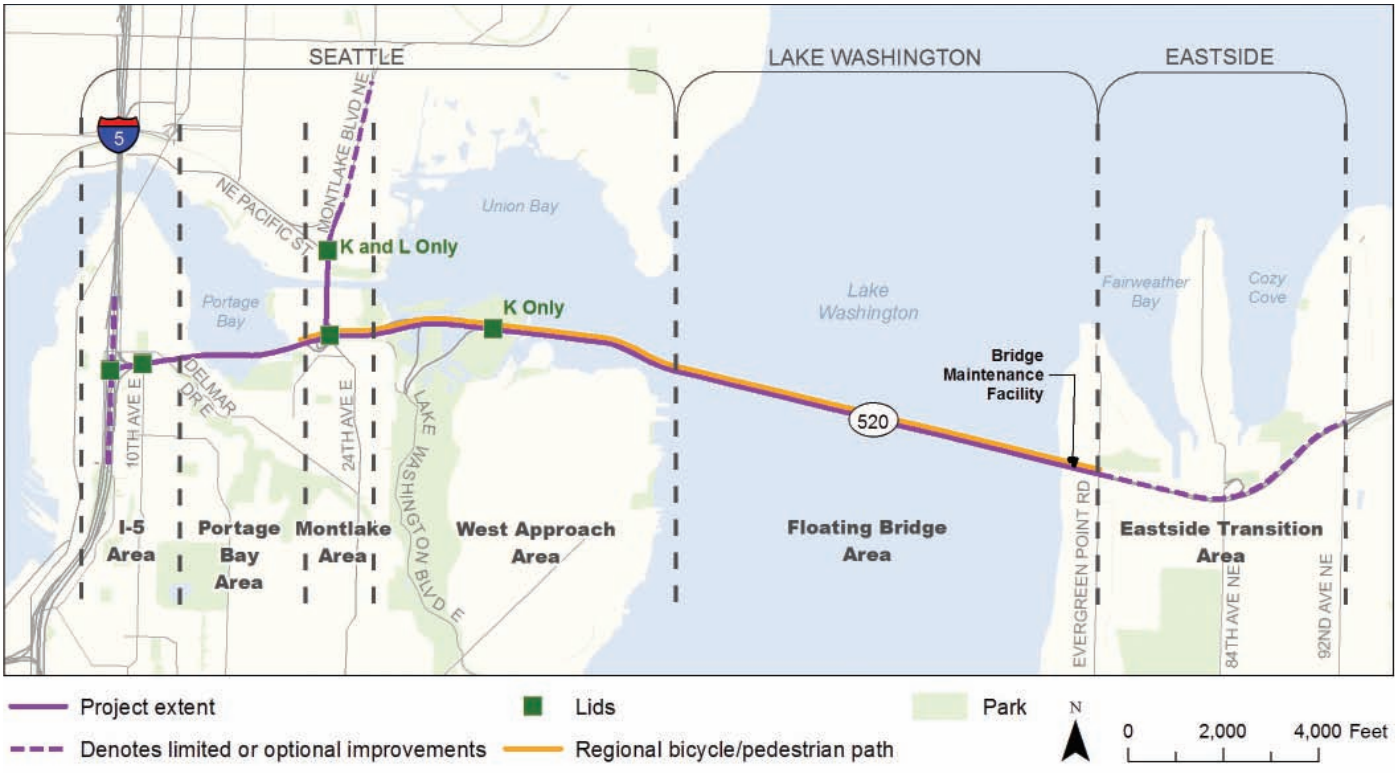
- Landscaped lids over sections of the highway.
- A regional bicycle and pedestrian path.
- Noise reduction measures.
- Stormwater treatment facilities.
- Automated tolling on SR 520.

Exhibit 1-5. 6-Lane Alternative roadway section



Proposed configuration of new Evergreen Point Bridge

Exhibit 1-6. Overview of the 6-Lane Alternative



Lids and landscape features

The 6-Lane Alternative includes lids in up to five locations:

- I-5/E. Roanoke Street (new lid developed through mediation).
- 10th Avenue E. and Delmar Drive E. (included in 2006 Draft EIS).
- Montlake vicinity – design and location vary by option (included in 2006 Draft EIS).
- Montlake Boulevard NE and NE Pacific Street (new lid developed through mediation; in Options K and L only).
- Foster Island "land bridge" (new lid developed through mediation; in Option K only).

The lids would reconnect neighborhoods, enhance movement of pedestrians and cyclists, restore and create views, and provide access to existing and new transit stops.

Regional bicycle/pedestrian path

The 6-Lane Alternative includes a 14-foot-wide bicycle/pedestrian path along the north side of SR 520 through the Montlake area and across the Evergreen Point Bridge to the Eastside. On the west side of the lake, the path would connect to the existing Bill Dawson Trail that crosses underneath SR 520 near the eastern shore of Portage Bay. It would also connect to the Montlake lids and East Montlake Park. On the Eastside, the path would connect to the bicycle/pedestrian path proposed as part of the SR 520, Medina to SR 202: Eastside Transit and HOV Project.

Existing bike path on I-90 bridge

A new path beginning in East Montlake Park would connect to a proposed new trail in the Arboretum (discussed in the Arboretum Master Plan), creating a loop trail. The portion of the existing Arboretum Waterfront Trail that crosses SR 520 at Foster Island would also be restored or replaced after construction of the SR 520 west approach structure. There would be no bicycle/pedestrian path along SR 520 west of Montlake Boulevard.

Noise reduction

Under FHWA regulations (23 CFR Part 772), noise abatement measures must be considered when highway noise levels approach or exceed the thresholds set in FHWA's noise abatement criteria, as they do along much of the SR 520 corridor and as they would continue to do under all alternatives without mitigation. Such measures must meet FHWA and WSDOT guidelines for feasibility and reasonableness, including a WSDOT requirement of making every reasonable effort to attain a 10-decibel or greater reduction in the first row of properties affected by project noise. WSDOT's practice is to work with the owners of these properties during detailed project design to determine the mitigation measures that will be used.

See Section 4.7 of the Supplemental Draft EIS for information on existing noise levels and the FHWA criteria.

The mediation group recommended traffic noise reduction measures for each design option. Option A was defined as including noise walls and/or quieter, rubberized asphalt pavement. Option K was defined as including only quieter, rubberized asphalt pavement for noise reduction. Option L would include noise walls similar to those defined in the Draft EIS, which would extend along most of the corridor. Although these recommendations reflect the preferences of the mediation participants, they do not affect FHWA's and WSDOT's responsibility to identify and consider effective noise abatement measures under existing laws.

Noise modeling done for the project indicates that noise walls would meet all FHWA and WSDOT requirements for avoidance and minimization of negative effects. Quieter pavement has not been demonstrated to meet these requirements in tests performed in Washington state,

and therefore cannot be considered as noise mitigation. The Supplemental Draft EIS evaluates all of the design options both with and without noise walls. WSDOT and FHWA will work with the affected property owners after a design option is selected to make a final determination of reasonable and feasible mitigation measures for project-related noise effects.

See Section 5.7 of the Supplemental Draft EIS for additional information on the performance of quieter pavement.

What are media filter vaults?

Media filter vaults are typically boxes made of concrete that contain a filtering system designed to protect surface water quality by removing pollutants from stormwater. Stormwater flows into the vault and through a filtering material (media) or cartridges before being discharged into the receiving water. Common filtering materials include sand, organic matter like wood chips and leaf mold, and activated carbon.

Stormwater treatment

The 6-Lane Alternative includes the installation of new facilities to collect and treat stormwater runoff. Three facility types incorporating stormwater best management practices (BMPs) approved by the Washington State Department of Ecology have been identified for the project: biofiltration swales, constructed stormwater treatment wetlands, and media filter vaults.

- Biofiltration swales are vegetation-lined channels designed to remove suspended solids from stormwater. They offer *basic* water quality treatment to remove pollutants such as metals, suspended solids, and nutrients from contaminated stormwater.
- Stormwater treatment wetlands offer *enhanced* treatment, which achieves greater removal of dissolved metals from stormwater than basic treatment. These wetlands provide enhanced treatment by using multiple treatment cells and wetland vegetation to reduce the amount of these pollutants in runoff.
- A media filter vault also offers enhanced treatment. It is an enclosed treatment facility (usually underground) that provides stormwater filtration. The vault houses one or more structures, each with a filtering cartridge. The vault channels collect stormwater through the filtering cartridge(s) at a controlled flow rate. These cartridges trap particulates and dissolved pollutants including metals, hydrocarbons, and nutrients.

Automated tolling

Tolling on SR 520 would be completely automated, with no toll booths. All one- or two-occupant vehicles would be charged a toll to cross the Evergreen Point Bridge. Users who are required to pay the toll would have transponders, or "cards," that would be read by an electronic card reader. Two types of transponders could be used: transponders that would attach permanently to a vehicle's windshield and portable transponders that could be transferred among multiple vehicles. Cars without transponders would have their license plates photographed and would be billed by mail.

Section 1.12 of the Supplemental Draft EIS provides more information on tolling legislation and assumptions.

What are the 6-Lane Alternative design options A, K, and L?

This Supplemental Draft EIS evaluates three design options—Options A, K, and L—for the 6-Lane Alternative. (A mediation process, described later in this document, identified 12 lettered options—Options A through L—and eventually focused on refining only A, K, and L.) The greatest physical differences among the options are in the Montlake Cut crossing, the location of the interchange in the Montlake area (Exhibit 1-7), and the profile of the west approach. The options can be summarized as follows:

- **Option A** is most similar to today's configuration, but with six lanes instead of four. It maintains the existing location of the Montlake interchange and adds a new bascule (draw) bridge over the Montlake Cut, parallel to the existing Montlake Bridge. Its profile rises from the west shore of Union Bay to a height of 15 to 20 feet over Foster Island, descends to the east of Foster Island, and then rises again to meet the west transition span.
- **Option K** includes a new single-point urban interchange (SPUI) about a half-mile east of the

existing Montlake interchange. The new interchange ramps would pass below the SR 520 roadway, with the northern leg of the interchange crossing beneath the Montlake Cut in a tunnel. The profile of Option K remains low throughout the west approach area. On Foster Island, the roadway would be excavated to about four feet below the existing grade to accommodate construction of the land bridge over the top.

- **Option L** would also include a SPUI with a similar alignment to Option K. However, instead of being beneath the SR 520 mainline, the interchange ramps would rise above it. The northern leg of the interchange would cross the Montlake Cut on a new bascule bridge. The west approach would rise at a constant slope from the west shore of Union Bay to the west transition span, with an elevation of approximately 10 to 15 feet above Foster Island.

All options place an emphasis on multimodal transportation by decreasing reliance on single-occupant vehicle travel and facilitating transit connections. All options would improve the overall flow of SR 520 traffic compared to the No Build Alternative. Each would include the common features described above—such as lids and landscaped features, stormwater treatment, and a regional bicycle/pedestrian path—although the specific details of those features differ among the options. While the design options vary mainly in the Montlake area, other differences include the width and the type of aesthetic treatment to be used for the Portage Bay Bridge, as well as the roadway profile across Foster Island and eastward to the floating bridge.

The description and evaluation of Options A, K, and L in the Supplemental Draft EIS are organized by three geographic areas along the project corridor: Seattle, Lake Washington, and the Eastside. Within these larger areas, project elements across all three options are described by geographic area, as identified in Exhibit 1-7 and Table 1-1. The project features for each design option are described under the geographic area headings, so that the differences among options can be easily identified and compared.

Suboptions to Options A, K, and L

Options A, K, and L each include potential "suboptions" (see Exhibit 2-16). These are specific design details that would have minor effects on the project footprint and could be added to the design options singly or in combination.

The suboptions for Option A are:

- Add an eastbound HOV direct-access on-ramp from Montlake Boulevard.
- Add an eastbound on-ramp and westbound off-ramp between SR 520 and Lake Washington Boulevard.
- Use the Option L roadway profile for the west approach bridge, which maintains a constant slope from the Montlake shoreline to the west highrise.

Option K has one suboption:

- Add an eastbound SR 520 off-ramp from SR 520 to Montlake Boulevard.

The suboptions for Option L are:

- Add left-turn access from Lake Washington Boulevard onto the SPUI south ramp.
- Add one northbound lane on Montlake Boulevard from Pacific Street to 25th Avenue NE.

The selected design option may include one or more of the suboptions described above. For example, if Option A is selected, it could include an eastbound HOV direct-access ramp, Lake Washington Boulevard ramps, and/or the Option L roadway profile. The evaluation of the suboptions in the Supplemental Draft EIS is designed to inform decisions on the final configuration of a selected design option.

Exhibit 1-7. 6-Lane Alternatives - design options

SR 520, I-5 TO MEDINA: BRIDGE REPLACEMENT AND HOV PROJECT | SUPPLEMENTAL DRAFT EIS

Exhibit 2-16. Montlake area – options A, K, and L with the suboptions

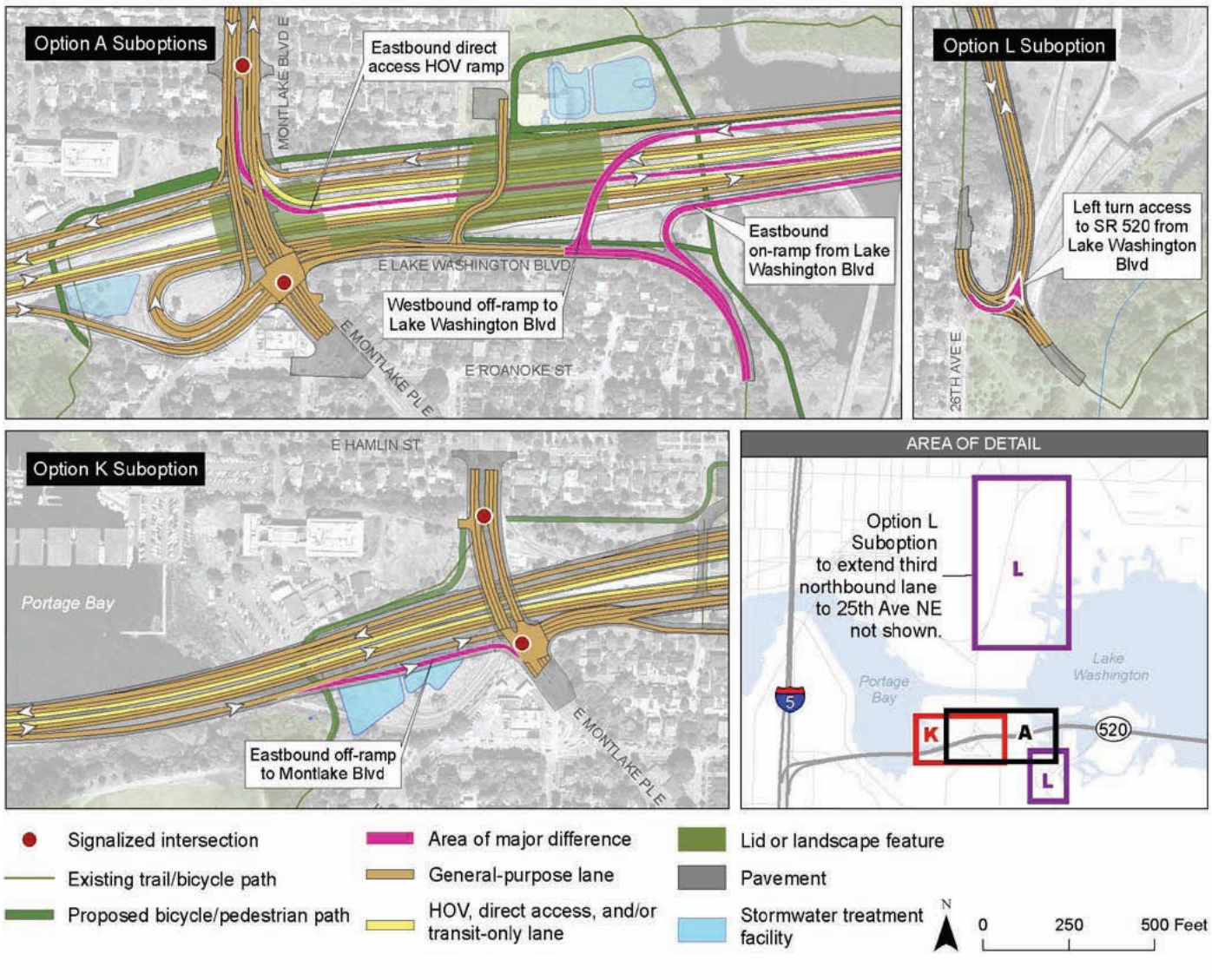


Table 1-1. Summary comparison of 6-Lane Alternative design options A, K, and L

Geographic Area	Option A	Option K	Option L
I-5 area	The SR 520 and I-5 interchange ramps would be reconstructed with generally the same ramp configuration as the ramps for the existing interchange. A new reversible HOV direct access ramp would connect SR 520 to the I-5 express lanes.		
Portage Bay area	The Portage Bay Bridge would be replaced with a wider and, in some locations, higher structure.		
	Under Option A, the Portage Bay Bridge would include six travel lanes plus an auxiliary lane.	Under Options K and L, the Portage Bay Bridge would be six lanes wide.	
Montlake area	All options propose changes in the Montlake area, with key differences in the treatment of the Montlake Boulevard interchange. All options would remove the Montlake freeway transit station and relocate its function.		
	Under Option A, the interchange would remain in the same location as today and a new bascule bridge would be constructed over the Montlake Cut. Potential suboption: • *Add eastbound HOV direct-access ramp from Montlake Boulevard.*	Under Option K, the interchange ramps would be eliminated and a new depressed SPUI would be constructed to the east. SPUI ramps would be constructed to the north through a tunnel under the Montlake Cut and to the south near the Arboretum. Potential suboption: • *Add eastbound SR 520 off-ramp to Montlake Boulevard (southbound, right turn only).*	Under Option L, the interchange ramps would be eliminated and a new elevated SPUI would be constructed to the east. SPUI ramps would be constructed to the north across a new bascule bridge over the Montlake Cut and to the south near the Arboretum. Potential suboption: • *Add northbound capacity on Montlake Boulevard to 25th Avenue NE.*
West approach area	The west approach structures would be replaced with wider and, in some locations, higher or lower structures. The options would differ in width and height.		
	Under Option A, the bridge structure would be 162 feet wide and 25 feet high over Foster Island. Potential suboptions: • *Add new Lake Washington Boulevard eastbound on-ramp and westbound off-ramp.* • *Use Option L (constant-rise) profile (see discussion of suboptions on page 13).*	Under Option K, the bridge structure would be 250 feet wide and the highway would be under a lid at Foster Island.	Under Option L, the bridge structure would be 270 feet wide and 13 feet high over Foster Island. Potential suboption: • *Add left-turn access from Lake Washington Boulevard to the SPUI south ramp.*
Floating bridge area	A new floating span would be located approximately 190 feet north of the existing bridge at the west end and 160 feet north of the existing bridge at the east end.		
Eastside transition area	A new SR 520 roadway would be constructed between the floating bridge and Evergreen Point Road.		

What decisions will FHWA and WSDOT make based on the information in the Supplemental Draft EIS?

It is FHWA's responsibility under NEPA, and WSDOT's under SEPA, to identify a preferred alternative for the SR 520, I-5 to Medina project. This will happen after agencies and the public have had an opportunity to comment on the choices and the legislature has considered the findings of the SR 520 Legislative Workgroup (described on page 25). Based on the current schedule, FHWA and WSDOT expect to identify a preferred alternative for the SR 520, I-5 to Medina project in spring 2010 after receiving comments on the Supplemental Draft EIS. The preferred alternative will be described in the Final EIS and formalized in the Record of Decision (ROD) for the project. The preferred alternative is expected to consist of six lanes across the SR 520 corridor from I-5 to Evergreen Point Road, plus one of the three design options (A, K, or L) and potentially one or more of its suboptions. Table 1-2 shows the possible choices; each column represents one possibility for the preferred alternative.

Should a decision be made to pursue any new design variations with significantly greater environmental effects than Options A, K, or L, they would need to be evaluated in another supplemental environmental document, which would change the project schedule.

Table 1-2. Range of possible choices for preferred alternative

SR 520 Corridor Alternative (I-5 to Medina)	6-Lane	6-Lane	6-Lane	No Build
Design Option (Montlake interchange area)	Option A	Option K	Option L	N/A
Suboptions (preferred alternative may include none, one, or more than one)	Eastbound HOV direct-access ramp Lake Washington Boulevard ramps Option L constant-slope profile	Eastbound off-ramp to Montlake Boulevard	Add northbound capacity on Montlake Boulevard Add left-turn access from Lake Washington Boulevard to SPUI south ramp	N/A

Project implementation: cost and schedule

How much would the project cost, and how much has been funded?

The total cost to construct the SR 520, I-5 to Medina project includes the cost of the westside portion plus the floating bridge (including the east approach and transition section) and pontoons. Costs vary depending on which design option is included. The costs are expressed as a range, reflecting the cost of the potential suboptions for each design option. The estimated costs are approximately:

- $3.4 billion to $3.7 billion for the 6-Lane Alternative with Option A.
- $5.4 billion to $5.5 billion for the 6-Lane Alternative with Option K.
- $3.9 billion to $4.0 billion for the 6-Lane Alternative with Option L.

Table 1-3 shows how the overall costs for the SR 520 corridor program—including the I-5 to Medina, Pontoon Construction, and Medina to SR 202 projects—would vary depending upon the design option included in the SR 520, I-5 to Medina project. The totals shown are the latest (2008), most likely cost estimates, and range between $4.53 and $6.67 billion at year of expenditure. As discussed previously, the Washington State Legislature has established a budget limit of $4.65 billion for the SR 520 corridor program as a whole. If a preferred alternative is selected for the SR 520, I-5 to Medina project that exceeds this limit, it is assumed that legislative action would be taken to revise the limit and/or that additional revenue sources would be identified to fill the gap.

Table 1-3. 2008 cost estimates for SR 520 corridor projects (year of expenditure)

	SR 520, I-5 to Medina Project				
2008 estimates	Seattle [a]	Floating bridge	Pontoon Construction	SR 520, Medina to SR 202 Project	Most likely total corridor cost
6-Lane Alternative with Option A	$2,022 to $2,298 million	$1,370 million	$358 million	$776 million	$4,526 to $4,802 million
6-Lane Alternative with Option K	$4,070 to $4,168 million	$1,370 million	$358 million	$776 million	$6,574 to $6,672 million
6-Lane Alternative with Option L	$2,562 to $2,642 million	$1,370 million	$358 million	$776 million	$5,066 to $5,146 million

Note: Estimates are adjusted to account for risk and inflation using the Cost Estimate Validation Process® (CEVP) method.

(a) The ranges shown reflect the cost of potential suboptions for each design option (see Table 1-1 for a description of the suboptions).

As shown in Table 1-4, the legislature has secured a variety of state and federal funding sources to help pay for the SR 520 program. However, the funding for the full corridor program falls over $2.65 billion short of the $4.65 billion total. WSDOT and the legislative workgroup are working to identify additional funding sources, including federal stimulus funding under the American Reinvestment and Recovery Act.

Table 1-4. Funding source

Funding Source	Amount
State gas tax	$552 million
Federal funds	$242 million
SR 520 Account (tolling and future federal funding)	$1,200 million
Total funding identified to date	$1,994 million
Unfunded portion of project cost	$2,656 million
Total program cost [(a)]	$4,650 million

(a) Total program cost is based on ESHB 2211 legislation.

When would the project be built?

Construction is planned to begin in 2012, after project permits are received. The floating bridge would open to traffic in 2014. If full funding is available, the entire project would be completed by 2018.

What is the Phased Implementation scenario?

If the entire project cannot be built at once due to funding constraints, WSDOT would first construct the most vulnerable components of the SR 520 corridor:

- Floating portion of Evergreen Point Bridge (Priority 1).
- Portage Bay Bridge (Priority 2).
- West Approach (Priority 3).

To address the potential for phased project implementation, the Supplemental Draft EIS evaluates the vulnerable structures separately as a subset of the "full build" analysis. This subset is referred to in the Supplemental Draft EIS as the Phased Implementation scenario.

For more detail about the Phased Implementation scenario, please see Section 2.4 of the Supplemental Draft EIS.

The process that led to the current alternatives and design options

What planning has taken place for the project, and who has been involved?

Project lead agencies

NEPA and SEPA require that one or more lead agencies take responsibility for the environmental review process. For this project, FHWA is the federal lead agency under NEPA, and WSDOT is the project proponent and the state lead agency under SEPA. FHWA is providing highway design guidance and environmental oversight. WSDOT is leading the highway design efforts and development of the EIS.

FHWA and WSDOT's cooperating agencies

Staff from the affected jurisdictions, representatives of state and federal natural resource agencies, and tribes provide advice and recommendations to the lead agencies about the scope and content of environmental analysis. These "cooperating agencies" are defined under NEPA as having a vested interest in a proposed project for which environmental documents are being prepared. Most cooperating agencies issue or contribute to permit decisions for a project, and will use FHWA's and WSDOT's EIS under NEPA or SEPA in support of these decisions. A list of cooperating agencies for the SR 520, I-5 to Medina project is shown in the call-out box.

WSDOT works with cooperating agencies through a forum known as the Regulatory Agency Coordination process. All agencies with jurisdiction over the project are invited to attend regular meetings, as are all tribes with fishing rights and/or cultural resource interests in the project area. While the Regulatory Agency Coordination process itself is primarily focused on sharing information, smaller technical working groups meet more often to focus on topics of specialized interest, including in-water construction, mitigation, stormwater, parks, Endangered Species Act compliance, and the design of the bridge maintenance facility. In the technical working groups, agency and tribal staff work closely with WSDOT to collaborate on methods for assessing effects and mitigation planning. WSDOT also meets periodically with resource agency directors to keep them apprised of project status.

Cooperating agencies

- Federal Transit Administration
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Washington State Department of Ecology
- Washington State Department of Fish and Wildlife
- Washington State Department of Natural Resources
- Washington State Recreation and Conservation Office
- Puget Sound Clean Air Agency
- Puget Sound Regional Council
- Sound Transit
- King County
- City of Clyde Hill
- City of Medina
- City of Seattle
- Town of Hunts Point
- Town of Yarrow Point
- Muckleshoot Indian Tribe
- Snoqualmie Tribe
- Suquamish Tribe
- The Tulalip Tribes
- Yakama Indian Nation
- Duwamish Tribe

Coordinating with Native American tribes

FHWA and WSDOT engage with affected tribes through government-to-government consultation and conduct outreach through correspondence, individual meetings, and resource agency meetings. The Muckleshoot Indian Tribe is the only tribe with usual and accustomed treaty fishing rights in Lake Washington and its tributaries. FHWA and WSDOT coordinate with the tribe about effects on fishing access and fish habitat.

The Muckleshoot Indian Tribe and the Snoqualmie Tribe are cooperating agencies under NEPA for the SR 520, I-5 to Medina project. In addition, in accordance with Section

106 of the National Historic Preservation Act, FHWA and WSDOT consult with the Muckleshoot Indian Tribe, the Snoqualmie Tribe, the Tulalip Tribes, the Suquamish Tribe, and the Confederated Tribes and Bands of the Yakama Nation. They also coordinate with the Duwamish Tribe, which is not federally recognized. FHWA and WSDOT will continue to coordinate with all of these tribes throughout project planning to identify important information on natural, cultural, and archaeological resources that may be encountered in the study area. The results of this coordination will be incorporated into the environmental and design process.

SR 520 ramps in the Washington Park Arboretum

How were the project alternatives and design options identified and evaluated?

Planning for the SR 520 corridor began in 1998 with the work of the Trans-Lake Washington Study, initiated by the legislature to explore ways of improving mobility across and around Lake Washington. The discussion below summarizes how WSDOT, FHWA, and numerous stakeholders have worked through the years to develop and evaluate project alternatives. Exhibit 1-3 provides an overview of major events in the project's development.

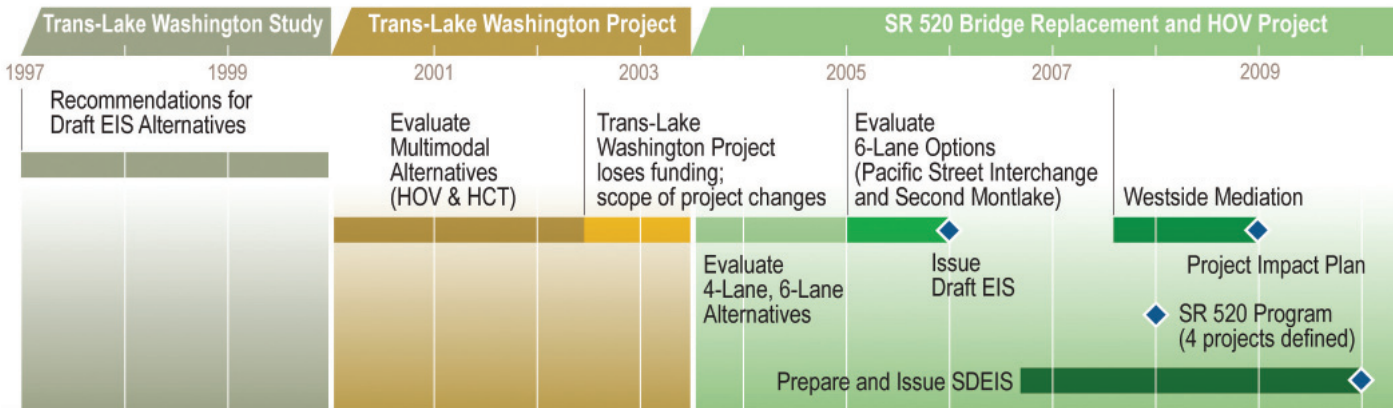
Chapter 1 of the Supplemental Draft EIS includes more information on the project's history.

What alternatives and design options were evaluated in the Draft EIS?

In the Trans-Lake Washington Study, a 47-member stakeholder group evaluated a broad range of potential modes and routes for crossing Lake Washington. The concepts the group considered included new project corridors (for example, a crossing from Sand Point to Kirkland); different crossing methods, such as tubes and tunnels; new travel modes, such as ferries or rail; and the management of travel demand through tolling or land use changes. These concepts were screened, and the most promising were combined into "solution sets," which ultimately formed the basis for the alternatives evaluated in the Draft EIS. The study recommended that the following configurations of SR 520 be carried forward as build alternatives:

- "Minimum Footprint" alternative (maintain existing four general-purpose lanes with improved shoulders and bicycle/pedestrian access).

Exhibit 1-3. SR 520 project timeline



- Add one HOV lane in each direction, for a total of six lanes.
- Add one HOV and one general-purpose lane in each direction, for a total of eight lanes.

The study also recommended that the 6- and 8-Lane Alternatives be evaluated with and without high-capacity transit in the corridor, because no regional decision had yet been made on whether SR 520 or I-90 would be the initial corridor to carry high-capacity transit across the lake to the Eastside. (Since that time, Sound Transit has identified I-90 in its ST2 Plan as the initial corridor for light rail transit across Lake Washington.)

In 2000, FHWA, WSDOT, Sound Transit, and the Federal Transit Administration initiated the EIS for what was then called the Trans-Lake Washington Project. This included establishing a series of committees (Executive, Technical, and Advisory) to help provide project oversight and guidance. The committees collaborated with the project leads to develop the project purpose and need statement (discussed earlier) and two levels of screening criteria to be used in evaluating how well alternatives met the purpose and need. The initial alternatives recommended by the Trans-Lake Washington Project were then screened using the criteria. Through the screening process, the conclusion was reached that I-90, rather than SR 520, would be the initial east-west corridor for high-capacity transit. Based on this decision, the Federal Transit Administration ceased participating as a co-lead agency in the SR 520 program.

Between 2003 and 2005, the SR 520 team advanced conceptual design of the corridor alternatives and conducted transportation and environmental analysis for the Draft EIS. During this time, the 8-Lane Alternative was dropped from further evaluation because transportation analysis showed that the increased traffic flow on SR 520 would necessitate extensive improvements and major impacts to I-5 and the SR 520/Interstate 405 (I-405) interchange. Thus, only the 4-Lane and 6-Lane Alternatives were studied in the Draft EIS.

- **The 4-Lane Alternative** evaluated in the Draft EIS would replace the existing SR 520 corridor with two general-purpose lanes in each direction—the same as today—and would include wider lanes and shoulders to meet current highway standards. All of the vulnerable structures in the corridor would be replaced with new structures, but no HOV and transit capacity would be added. While the 4-Lane Alternative improves safety and reliability in the corridor, the Draft EIS traffic analysis showed that it did not meet the project purpose of improving the movement of people and goods across SR 520.
- **The 6-Lane Alternative** evaluated in the Draft EIS included two general-purpose lanes and one inside HOV lane in each direction, along with wider lanes and shoulders to meet current highway standards. It would replace all of the corridor's vulnerable structures and add new capacity for transit and carpooling. Unlike the 4-Lane Alternative, the 6-Lane Alternative included lids across sections of SR 520 designed to help reduce the effects of adding two new lanes to the corridor and to connect communities on either side of the highway. The Draft EIS analysis indicated that the 6-Lane Alternative would meet the project purpose, because in addition to improving safety and reliability by providing new bridges and wider lanes, it would increase mobility for people and goods by including continuous HOV lanes throughout the corridor.

What were the Draft EIS 6-Lane Alternative design options?

In 2005, after the 6-Lane Alternative had been developed and discussed with project stakeholders, neighborhoods adjacent to the highway expressed concern that the 6-Lane Alternative, as then configured, was too wide in the Montlake interchange area. Communities and transit agencies also expressed interest in developing better connections between SR 520 and proposed regional transit facilities. In response, WSDOT worked with stakeholders to develop several additional "design options"—different configurations of the 6-Lane Alternative within the Montlake interchange area that would reduce the 6-Lane Alternative's effects and/or enhance its benefits. The Draft EIS evaluated three 6-Lane Alternative design options in Seattle:

- **The Pacific Street Interchange option** proposed to consolidate the existing Montlake and Lake

Washington Boulevard interchanges into one new interchange, located east of the existing Montlake interchange. It also included a four-lane bridge over Union Bay, terminating at the existing intersection of Montlake Boulevard East and Pacific Street. This option was designed to provide more reliable transit connections to the Montlake multimodal center and the future Sound Transit Link light rail station near Husky Stadium.

- **The Second Montlake Bridge option** proposed a second drawbridge across the Montlake Cut, parallel to the existing Montlake Bridge. Like the Pacific Street Interchange, it eliminated the Montlake freeway transit station, but provided more reliable connections to the Montlake multimodal center of the Link light rail station at Husky Stadium.
- **The No Montlake Freeway Transit Stop option** proposed to eliminate this freeway transit station, independent of other design changes. This would require relocation of transit riders and services currently using the facility.

The *SR 520 Bridge Replacement and HOV Project Draft EIS*, which evaluated the alternatives and options described above, was published in August 2006.

What community and legislative processes have happened to identify a preferred 6-Lane Alternative design option?

In December 2006, in a report entitled *A Path Forward to Action*, Governor Christine Gregoire identified the 6-Lane Alternative as the state's preference for the SR 520 corridor. Governor Gregoire wrote:

> "I believe the needs of the regional transportation system will best be served by an alternative that replaces the four existing general-purpose lanes and adds two HOV lanes to strengthen regional transit services. The ongoing environmental review process provides support for this approach."

However, the Governor noted the diversity of public opinions expressed about the Draft EIS and through public outreach efforts regarding the configuration and effects of the 6-Lane Alternative and its design options. She concluded:

> "The impacted communities on the west end of the project need to determine what design from Union Bay and westward to I-5 will best serve the neighborhoods, the University of Washington, and parks and natural resources. City and community leaders and residents need to come together and develop a common vision on the best solution that fits the character and needs of the local communities. I have asked WSDOT to provide support when requested for such a process."

What was the mediation process and what were the results?

In spring 2007, responding to the Governor's request, the Washington State Legislature passed Engrossed Substitute Senate Bill (ESSB) 6099. The bill directed the Office of Financial Management to hire a mediator and appropriate planning staff to develop a six-lane corridor design for the Seattle portion of the project area. Specifically, the bill directed the mediation group to prepare a project impact plan to address the impacts of the SR 520 Bridge Replacement and HOV Project's design on Seattle city neighborhoods and parks. The bill also directed that the project impact plan provide a comprehensive approach to mitigating the impacts of the project, including incorporating construction mitigation plans. It required that the plan be submitted to the Governor and legislature by December 2008.

Mediation workshops provided an opportunity for input on developing an alignment through Seattle

Mediation participants

The mediation participants were identified through interviews with a broad range of stakeholder organizations, including those identified in the legislation and others who had been actively involved with the SR 520 project during development of the Draft EIS. (See the text box for a list of organizations that were represented in the mediation group.) Over the course of 2008, the mediation participants developed and reviewed more than a dozen design options for the configuration of SR 520 through Seattle.

To learn more about the range of design options developed through mediation, please see Section 1.7 of the Supplemental Draft EIS.

Mediation options evaluated and conclusions

Mediation participants evaluated and refined design options at monthly meetings that were held from November 2007 through February 2008. The meetings included presentations from WSDOT, independent experts, and the mediation participants.

In February 2008, mediation members agreed to focus on Options A, K, and L with various suboptions for each. Subsequent meetings of the mediation group focused on refining these options to more closely meet the goals of mediation participants. The mediation design options ultimately agreed upon by the group are described in the SR 520 Bridge Replacement and HOV Project Westside Project Impact Plan and defined more fully in Chapter 2 of the Supplemental Draft EIS. As noted above, WSDOT agreed to evaluate these design options in a Supplemental Draft EIS.

As required by NEPA and SEPA, the Supplemental Draft EIS objectively analyzes and discloses the effects of the project with each of the design options now being considered. WSDOT has continued to work with resource and permitting agencies and tribes to share information on the design options and to ensure that the analysis reflects the regulatory and treaty requirements with which the project must comply. The Supplemental Draft EIS reflects the results of this coordination and provides information on how the design options perform with regard to mobility, safety, and environmental effects.

More information on how the mediation options were evaluated can be found in the SR 520 Bridge Replacement and HOV Project Westside Project Impact Plan (SR 520 Mediation Panel 2008) and the Agency Coordination and Public Involvement Discipline Report (Attachment 7 of the Supplemental Draft EIS).

Organizations Represented in the Mediation Group

- Arboretum Foundation/Arboretum and Botanical Garden Committee
- Bellevue Chamber of Commerce
- Boating Community
- Cascade Bicycle Club
- City of Medina
- City of Clyde Hill
- City of Bellevue
- City of Kirkland
- Eastlake Community Council
- Federal Highway Administration
- Freight Advisory Committee
- Friends of Seattle's Olmsted Parks
- King County Metro Transit
- Laurelhurst Community Council
- Madison Park Community Council
- Montlake Community Council
- National Marine Fisheries Service (also representing U.S. Fish and Wildlife Service and tribal fishing interests)
- North Capitol Hill Community Council
- Office of the Governor (representing state agencies, including the Departments of Ecology, Fish and Wildlife, Archaeology and Historic Preservation, Natural Resources, and the Recreation and Conservation Office)
- Ravenna Bryant Community Council
- Roanoke/Portage Bay Community Council
- Seattle Chamber of Commerce
- Seattle City Council
- Seattle Design Commission
- Seattle Mayor's Office
- Sound Transit
- Town of Hunts Point
- Town of Yarrow Point
- Transportation Choices Coalition
- University District Community Council
- University of Washington
- U.S. Coast Guard
- WSDOT
- Washington State Legislature (one seat available to any legislator who wished to attend a mediation session)

What was the SR 520 Legislative Workgroup and what were the findings?

In May 2009, Governor Gregoire signed Engrossed Substitute House Bill (ESHB) 2211, which authorized tolling on the Evergreen Point Bridge

beginning in 2010 and set the budget for the SR 520 program at $4.65 billion. (Project costs and tolling were discussed earlier in this document.) The bill also established a legislative workgroup on SR 520, which was charged with the following responsibilities:

- Recommend design options that provide for a full SR 520 corridor project that meets the needs of the region's transportation system while providing appropriate mitigation for neighborhoods and communities in the area directly affected by the project.
- Review and recommend a financing strategy, in conjunction with WSDOT, to fund the projects in the SR 520 corridor that reflects the recommended design options.
- Present a final report with recommendations on financing and design options to the legislature and the Governor by January 1, 2010.
- Form a subgroup to conduct a detailed review of design options between I-5 and the west end of the floating bridge, consult with affected neighborhood and community groups, and make recommendations.

Legislative workgroup findings

The legislative workgroup met in July, September, November, and December 2009. These meetings were augmented by three meetings of the Westside subgroup (one meeting each in September, October, and November) and two working sessions of the full workgroup in October and November. The workgroup received extensive input from mediation participants about ideas for modifying the design options. These ideas were intended to reduce costs and/or better achieve project objectives. WSDOT assisted with layout of the new concepts and provided information to support the work of an expert review panel, which validated WSDOT's budget and schedule estimates. The workgroup also solicited advice from resource agencies, local jurisdictions, the Seattle Parks Department, the Coast Guard, and other stakeholders. State budget officials and financing specialists identified potential funding sources and scenarios for the project.

ESSB 6099

ESSB 6099 directed Washington's Office of Financial Management to hire a mediator to facilitate a Westside mediation group. The group was required to focus on SR 520 project impacts on Seattle city neighborhoods, parks, and institutions of higher education, and to submit a project impact plan to the Governor and Legislature by December 2008. ESSB 6099 legislative goals include the following:

- Minimize the total footprint and width of the bridge.
- Minimize the project impact on surrounding neighborhoods.
- Incorporate the recommendations of a Health Impact Assessment.
- Effectively prioritize travel time, speed, and reliability.
- Provide six total lanes, with four general-purpose lanes and two HOV lanes.
- Describe in environmental documents the alignment and footprint of the preferred alternative.

SR 520 Legislative Workgroup Members

- Senator Mary Margaret Haugen, 10th District
- Senator Dan Swecker, 20th District
- Representative Dan Roach, 31st District
- Representative Judy Clibborn, 41st District
- Senator Ed Murray, 43rd District
- Representative Jamie Pedersen, 43rd District
- Representative Frank Chopp, 43rd District
- Senator Eric Oemig, 45th District
- Representative Larry Springer, 45th District
- Senator Ken Jacobsen, 46th District
- Representative Scott White, 46th District (Workgroup co-chair)
- Senator Rodney Tom, 48th District (Workgroup co-chair)
- Representative Ross Hunter, 48th District
- Representative Deborah Eddy, 48th District
- Richard Ford, Transportation Commission, King County
- Paula Hammond, Washington State Secretary of Transportation

New ideas proposed to the workgroup by the mediation participants included the following:

- Option A+, which would add Lake Washington Boulevard ramps and an eastbound HOV direct-access ramp to Option A to increase mobility, as well as include a constant-slope profile (similar to Option L, see page 13) for the west approach to improve stormwater drainage and treatment. These proposed changes are all evaluated as suboptions in the Supplemental Draft EIS.
- Option M, which would eliminate the Option K SPUI and replace the bored tunnel with an immersed-tube tunnel that would be built by excavating across the Montlake Cut rather than tunneling below it.

On November 17, 2009, the workgroup made a draft recommendation to forward Option A+ to the legislature and the Governor as its preferred design option for the 6-Lane Alternative. The workgroup's recommendations were presented to the Seattle City Council on November 24, 2009, and to the public in a town hall meeting that same evening. Both meetings provided opportunities to comment on the options and the workgroup's decision process. At each meeting, people expressed support for a variety of choices, including Option M, Option A+ with and without the Lake Washington Boulevard ramps, a transit-optimized 4-Lane Alternative, and retrofitting the seismically vulnerable bridges to allow more time to develop a long-term solution. A number of people expressed the general sentiment that no matter what solution was chosen, it should be implemented quickly to provide jobs, enhance mobility, and reduce the risk of catastrophic failure.

On December 8, 2009, the legislative workgroup reconvened and confirmed their earlier recommendation that Option A+ should be the preferred design option for the 6-Lane Alternative. The report reiterated the recommendation of Option A+ for the 6-Lane Alternative, and included a minority report by the three workgroup members who opposed the recommendation. The workgroup's final report was submitted to the Governor in early January 2010.

How will the results of mediation and the legislative workgroup be integrated with the environmental process?

This Supplemental Draft EIS provides information on the environmental effects of the 6-Lane Alternative with each of the three design options in order to support the selection of a preferred alternative under NEPA and SEPA. Although the mediation participants, the legislative workgroup, and other political bodies can provide recommendations, it remains FHWA's responsibility under NEPA, and WSDOT's under SEPA, to select the final preferred alternative and to ensure that the environmental review process has evaluated a reasonable range of alternatives. The preferred alternative selection will occur after public comment on the Supplemental Draft EIS and after the workgroup's final report has been released.

When the workgroup's deliberations began, WSDOT was already well underway in its NEPA evaluation of Options A, K, and L. The recommended Option A+ is evaluated in the Supplemental Draft EIS as Option A with all three of its proposed suboptions (see page 13). Therefore Option A+ would not require additional evaluation to become part of the NEPA preferred alternative. Option M is similar to Option K; however, the proposed method of tunnel construction has substantially different impacts than those described in the Supplemental Draft EIS, and would require additional environmental evaluation—likely in the form of another Supplemental Draft EIS—if the legislature chose to pursue further study of it.

Which alternatives have been eliminated from further study?

The 4-Lane Alternative was identified in the Draft EIS as not fully meeting the project purpose and need. While it would improve safety by replacing vulnerable structures and widening lanes and shoulders, it would not meet the project purpose of improving mobility in the SR 520 corridor. Additional modeling using the updated traffic model for the Supplemental Draft EIS confirms that the 4-Lane Alternative would provide substantially lower mobility benefits than the 6-Lane Alternative for both general-purpose traffic and transit. Therefore, the 4-Lane Alternative has been eliminated from further study.

The 6-Lane Alternative design options evaluated in the Draft EIS have also been eliminated from consideration. Public comments on the Draft EIS expressed strong opinions either for or against specific design options. While many expressed strong support of the Pacific Street Interchange option, comments from members of the public, environmental resource agencies, tribes, and the University of Washington reflected serious concerns about the impacts of this option. Findings by the Seattle City Council indicated that the 6-Lane Alternative and design options, as described in the Draft EIS, were too wide through the corridor and that mitigation for their construction effects needed to be further defined. The level of controversy and concern generated by the Draft EIS design options was a key factor leading to the establishment of the mediation process. Consequently, the design options resulting from mediation are now the only ones under consideration. The 6-Lane Alternative studied in the Supplemental Draft EIS has also been narrowed throughout the corridor to reduce its overall footprint.

As noted earlier, the Trans-Lake Washington Project also evaluated an 8-Lane Alternative, which was one of the original alternatives recommended by the Trans-Lake Washington Study Committee. Various studies indicated that this alternative would not perform effectively due to existing bottlenecks at I-5 and I-405. On the basis of these findings, the 8-Lane Alternative was eliminated from further study prior to the Draft EIS.

Project effects and mitigation

What are the effects of the project?

The SR 520, I-5 to Medina project would have both beneficial and adverse environmental effects. The effects of the project during operation and the effects during construction are summarized in the following tables.

A full accounting of operational and construction effects is provided in Chapters 5 and 6, respectively, of the Supplemental Draft EIS.

Summary of project operation and permanent effects

The table below summarizes the project operation and permanent effects of the 6-Lane Alternative options on each element of the environment. Additional effects resulting from the suboptions are shown in italics. Effects from adding the suboptions to each option are noted only where they would result in a measurable difference to the effects described.

Summary of project operation and permanent effects

Element of the Environment	Option A	Option K	Option L
Transportation	All options include HOV lanes in both directions, an HOV direct-access ramp to I-5 express lanes, and HOV bypass lanes on all on-ramps. All options would serve more vehicles and more people than the No Build Alternative. Overall congestion and travel times for both general-purpose and HOV trips would be reduced, particularly during the eastbound morning and westbound afternoon peak periods.		
Travel Demand and Freeway Operations	The 6-Lane Alternative would allow SR 520 to serve more traffic than the No Build Alternative during the peak period: up to approximately 700 more vehicles per hour and 2,100 more people per hour. Comparing the No Build Alternative with the 6-Lane Alternative, year 2030 congestion and HOV travel times between I-5 and SR 202 would be reduced between an average of 2 to 8 minutes during the morning peak period and 5 minutes during the evening peak period. However, during the peak of the evening commute period the completion of the eastbound HOV lane could save both general-purpose and HOV vehicles approximately 40 minutes.		
Local Traffic Volumes and Operations	The greatest effect on traffic volumes would occur in the Montlake Boulevard interchange area.		

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Local Traffic Volumes and Operations (continued)	Under Option A, traffic volumes north and south of the Montlake Cut would be similar to the No Build Alternative, except on Lake Washington Boulevard south of the SR 520/Arboretum ramps. Volumes at this location would decrease with the closure of the Lake Washington Boulevard off-ramps. Traffic operations within the Montlake area would improve at one intersection during the a.m. peak hour and four intersections during the p.m. peak.	Under Options K and L, traffic volumes north and south of the Montlake Cut would increase when compared to the No Build Alternative and Option A. This is because drivers would take advantage of the capacity made available with the new interchange (SPUI) and its connecting ramps north and south of the Montlake Cut. Traffic volumes would decrease on the existing Montlake Bridge because access to SR 520 would occur via the new SPUI ramps. Traffic operations within the Montlake area would improve at one intersection during the a.m. peak hour and three intersections during the p.m. peak.	
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would result in improved intersection operations in the Montlake Boulevard interchange area. Traffic volumes at Lake Washington Boulevard would be similar to the No Build.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would allow drivers to head directly south on Montlake Boulevard without having to use the new SPUI and turnaround, thereby reducing delay compared to Option K.*	*Adding the northbound lane on Montlake Boulevard north of the Montlake Cut would result in shorter delays at the Montlake Boulevard/NE Pacific Street intersection, although it would still operate at Level of Service F.* *Adding the left turn access at Lake Washington Boulevard to Option L would allow drivers south of the cut on Montlake Boulevard to access the SR 520/ SPUI, resulting in a shift away from the Montlake Bridge to Lake Washington Boulevard, which would worsen operations at the SR 520 ramps/Lake Washington Boulevard intersection compared to Option L.*
Transit	All options would substantially increase the demand for transit service, allowing SR 520 to carry more people with greater efficiency. This increase reflects the effect of tolling on mode choice, the reversible connection to the I-5 express lanes and other corridor improvements. The capacity added across the Montlake Cut with all options would improve local traffic operations and allow transit to move faster and more reliably than the No Build Alternative.		
Suboptions	*Adding the Lake Washington Boulevard ramps and eastbound HOV direct-access ramp to Option A would further reduce transit travel times compared to the No Build Alternative and Option A.*		

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Montlake Freeway Station	All options would remove the Montlake Freeway Transit Station and replace its function at other nearby transit stops. Loss of the transit station would require passengers to change their current travel routes and these changes could include using light rail, additional bus transfers, and finding alternate bus routes to get to the same destination.		
Land Use and Economic Activity	WSDOT would acquire land in order to accommodate right-of-way for the 6-Lane Alternative options. All options would permanently remove a residence on the west end of the Portage Bay Bridge and the Museum of History and Industry (MOHAI) building.		
	Option A would require the least amount of new right-of-way (11.1 acres). This option would result in seven full parcel acquisitions, and would remove two additional residences, the Montlake 76 gas station, and nine of the 11 buildings on the south campus of NOAA's Northwest Fisheries Science Center.	Option K would require the most new right-of-way (15.7 acres). This option would result in six full parcel acquisitions, and the University of Washington's Waterfront Activities Center (WAC) would be relocated for a multiple-year period.	Option L would require 11.9 acres of new right-of-way. This option would result in five full parcel acquisitions.
	Estimated property tax effects would be similar across all options, and result in a less than 0.01 percent decrease in tax revenue.		
Suboptions			*Adding northbound capacity on Montlake Boulevard would require an additional 1.4 acres of right-of-way acquisition.*
Social Elements	All 6-Lane Alternative options include lids that would benefit community cohesion by reconnecting neighborhoods originally bisected by SR 520 and I-5, providing linkages between adjacent and nearby parks, improving views toward the highway from nearby residences, and providing safe passage across I-5 and SR 520. Option K includes three additional landscape features: one across Foster Island, one across E. Lake Washington Boulevard (partial lid), and one at the NE Pacific Street and Montlake Boulevard NE intersection. Option L also includes a lid at the NE Pacific Street and Montlake Boulevard NE interchange.		
	Low-income populations would experience disproportionately high and adverse effects as a result of tolling. The most affected low-income populations would be those that are car-dependent and populations living in areas with limited transit service.		
	The north shift of the bridge could change tribal fishing locations somewhat, but it would not reduce overall access to Lake Washington by fishing boats.		
Recreation	Loss of parkland would occur for right-of-way acquisition of all or part of up to five recreational properties (depending on the option). The largest acquisitions would occur at McCurdy and East Montlake Parks. There could be negative effects related to visual quality and aesthetics where widening of the roadway would bring the project footprint closer to parks. All options would acquire Bagley Viewpoint in its entirety. Under all options the west approach bridge through the Arboretum would be much wider than the existing bridges which could change boaters' and park users' experience in this area.		
	Option A would acquire 5.55 acres of park land.	Option K would acquire 7.55 acres of park land.	Option L would acquire 7.05 acres of park land.

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Recreation (continued)		The Option K land bridge located on the north portion of Foster Island would change the island from a wetland viewing area to a more landscaped upland setting.	
	The landscaped lids at I-5, 10th Avenue E. and Delmar Drive E., and in the Montlake area would provide new areas for passive recreation. Trails across these lids would further improve connectivity for bicyclists and pedestrians. The proposed regional bicycle/pedestrian path across SR 520 would provide a new connection between the City of Seattle's bicycle and pedestrian system and the Points Loop Trail in Medina.		
Section 4(f) Evaluation	The Section 4(f) Evaluation assesses the project's proposed use of parks, recreation areas, wildlife refuges, and historic properties protected under Section 4(f) regulations. There are 10 park and recreation facilities, 1 presumed Traditional Cultural Property and 234 historic properties that could potentially be affected by the proposed project and that are protected under Section 4(f) regulations. And, there is no feasible and prudent alternative that would avoid the use of all Section 4(f) properties. Of these 10 park and recreation resources and 234 historic properties, four parks, two trails, and 11 historic properties would experience a use as defined by Section 4(f), depending on the 6-Lane Alternative design option implemented. Note: *De minimis* means that the project does not "adversely affect the activities, features and attributes" of the Section 4(f) resource. • Foster Island, located in the Washington Park Arboretum, would be affected by all options and is considered a Traditional Cultural Property eligible for listing in the National Register of Historic Places (NRHP). • All options incur *de minimis* use of Fire Station #22, the Canoe House, and the Montlake Cut. • At differing capacities, all options permanently use Bagley Viewpoint, East Montlake and McCurdy Parks, University of Washington Open Space, Washington Park Arboretum, the Arboretum Waterfront Trail, and the Governor Albert D. Rosellini Bridge/Evergreen Point Bridge. • At differing capacities all options would temporarily occupy Interlaken Park, Montlake Playfield, and the Bill Dawson Trail.		
Section 6(f) Evaluation	The Section 6(f) Evaluation assesses parks and other recreation facilities acquired and/or developed using funds from the Land and Water Conservation Fund Act of 1965, which are protected from conversion to non-recreational uses. The Ship Canal Waterside and Arboretum Waterfront Trails are Land and Water Conservation Fund-assisted resources, including the parcels upon which they are located. Also assessed are the protection of facilities acquired or developed using Washington State Aquatic Lands Enhancement Account funds. The Arboretum Waterfront Trail was redeveloped using these funds.		
Visual Quality	All options would affect visual quality as a result of the new lids and wider bridges and roadways that would be shifted in some areas and raised or lowered in other areas.		
	All options would improve the visual quality of the Roanoke landscape unit near the I-5 interchange with the addition of the I-5 and 10th Avenue E. and Delmar Drive E. lids.		

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Visual Quality (continued)	The overall quality of the Portage Bay landscape unit would not change but views under the Portage Bay Bridge would open up because of the wider column spacing, especially looking northward from the south side of the bridge.		
	All options would result in changes to the visual character and quality in the Montlake area. The mainline profile for all options through the Montlake area would be at roughly the same height as the existing SR 520 mainline and therefore would be about as visible as the existing roadway from most residences, where not covered by the lid. However, Option K and L would include additional structures in the McCurdy Park and East Montlake Park areas that would be most visible to motorists and park users. These structures would dominate views much more than the existing ramps and mainline.		
		Option K would include a SPUI and tunnel configuration that would require tall retaining walls at the tunnel entrance and columns to support the mainline over the SPUI.	Option L would include an elevated SPUI over the mainline and a new bridge through East Montlake Park and over the Montlake Cut.
	Under Option A, the SR 520 bridge over Foster Island would be higher than the existing bridge and the bridge proposed for Option L.	Under Option K, the land bridge at Foster Island would remove naturalized woodlands on both sides of SR 520.	Under Option L, the bridge on Foster Island would be wider than the existing bridge and 2 to 4 feet higher at the Arboretum Water Trail.
Suboptions	*Adding the eastbound HOV direct-access on-ramp could be visible from distant viewpoints because of its height, and the ramp itself would add to the complexity of the overall structure. Adding the Lake Washington Boulevard ramps to Option A would remove mature trees to the east of Lake Washington Boulevard E. These trees now buffer the view of the roadway from several Montlake homes and the boulevard. Adding the constant-slope profile would result in a bridge height similar to Option L.*		

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Cultural Resources	Several effects on historic properties of the built environment were identified from the 6-Lane Alternative options. Based on available information, some of these effects will be considered adverse (all effects determinations are preliminary, pending State Historic Preservation Officer concurrence), as follows: • NOAA Northwest Fisheries Science Center – experiences an adverse effect under Option A • Montlake Bridge – experiences an adverse effect under Option A • 2111 E. Shelby Street – experiences an adverse effect under Option A • Montlake Historic District – experiences an adverse effect under Options A and L • 2158 E. Shelby Street – experiences an adverse effect under Option L • 2159 E. Shelby Street – experiences an adverse effect under Option L • Foster Island presumed Traditional Cultural Property – experiences potential adverse effect under Option K At this time, WSDOT, on behalf of FHWA, has not made a definitive Section 106 effects determination for the project. Once a preferred alternative has been selected and all effects can be fully evaluated, a determination of effects for the project will be made.		
Suboptions	*Adding the Lake Washington Boulevard ramp suboption to Option A would result in increased visual effects on the NRHP-eligible Montlake Historic District and two houses that are individually NRHP-eligible, such as changes to the setting and feeling, affecting contributing properties along Lake Washington Boulevard E. and 26th Avenue E.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would result in a minimal additional effect on the Montlake Historic District.*	*Adding northbound capacity on Montlake Boulevard would result in replacement of the three NRHP-eligible pedestrian bridges over Montlake Boulevard NE, constituting an adverse effect.*
Noise	Without noise mitigation, all options would have a somewhat smaller number of residences where noise levels exceed the Noise Abatement Criteria (NAC) than the No Build Alternative. This is because of the noise-reducing elements of the proposed design, which include lids, depressed roadway sections, and roadway realignments. The addition of lids and landscape features over the highway would be the primary reasons for the reduction in noise levels.		
Residences Exceeding the Noise Abatement Criteria	Under Option A, 249 residences would exceed the NAC. With noise walls, 94 residences would exceed the NAC.	Under Option K, 256 residences would exceed the NAC. With noise walls, 123 residences would exceed the NAC.	Under Option L, 235 residences would exceed the NAC. With noise walls, 119 residences would exceed the NAC.
Air Quality	All options would meet air quality standards. The modeled concentrations of air pollutants are well below the 1-hour and 8-hour National Ambient Air Quality Standards for all design options.		

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Air Quality (continued) *Suboptions*	*Adding the suboptions to Option A would result in a slight increase in carbon monoxide concentrations at the Montlake Boulevard/Pacific Street intersection.*		
Energy and Greenhouse Gases	All options would reduce annual energy consumption between 5 and 10 percent on SR 520 between Seattle and Medina.		
	All options would reduce greenhouse gas emissions by approximately 10 percent in the project area.		
Water Resources	All options would increase the amount of land covered by pollutant-generating impervious surfaces in the project area (Option A – 35 percent increase, Option K – 45 percent increase, and Option L – 44 percent increase). By applying stormwater treatment in the designs, all options would meet state and federal water quality regulations and would provide more water quality treatment than is required for stormwater under the specific conditions of WSDOT's Highway Runoff Manual at several locations.		
Ecosystems	All of the options would reduce the availability and quality of wetland and wetland buffer habitat due to filling and shading. Option K would fill the most wetland and wetland buffer area. All of the options would reduce fish habitat functions, primarily due to increased shading by the larger overwater structures. Compared to the existing structures, the proposed overwater structures are about twice as wide for all options. Option L would result in the most overwater shading in the west approach area. Option K would result in the overall greatest loss of fish habitat due to the filling for the depressed SPUI. All of the options would affect wildlife by permanently removing vegetation and wildlife habitat, and by increasing shading. Increased bridge elevation could have both positive and negative effects on wildlife movement and behavior. Option K would result in the greatest loss of wildlife habitat.		
Wetlands	Option A would fill 0.1 acre of wetland and 0.7 acre of wetland buffer. Option A would shade 3.2 acres of wetland and 0.9 acre of wetland buffer.	Option K would fill 1.8 acres of wetland and 5.4 acres of wetland buffer. Option K would shade 2.8 acres of wetland and 0.1 acre of wetland buffer.	Option L would fill 0.3 acre of wetland and 1.5 acres of wetland buffer. Option L would shade 4.3 acres of wetland and 1.3 acres of wetland buffer.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would fill an additional <0.1 acre of wetland and an additional 0.1 acre of wetland buffer. It would also shade an additional 0.1 acre of wetland.*	*Adding the suboption to Option K would fill an additional <0.1 acre of wetland and an additional <0.1 acre of wetland buffer.*	*Adding northbound capacity on Montlake Boulevard would fill an additional <0.1 acre of wetland and an additional <0.1 acre of wetland buffer, and would shade an additional <0.1 acre of wetland.*

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Fish Resources	Option A would result in the most shading through Portage Bay – 5.7 acres. Option A would be higher than Options K and L, and the existing bridges through Union Bay and east of Foster Island. It would result in 16.1 acres of shading in the Montlake and west approach areas.	Option K would result in the least shading through Portage Bay – 4.6 acres. Option K would be below the high-water elevation east of the Montlake shoreline, and much lower than the other options through Union Bay and east of Foster Island. It would result in filling approximately 2.7 acres of aquatic habitat and 10.3 acres of shading in the Montlake and west approach areas.	Option L would result in 4.8 acres of shading through Portage Bay. Option L would be higher than Option K, but lower than Option A. It would result in 12.5 acres of shading in the Montlake and west approach areas.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would shade an additional 2.3 acres of aquatic habitat in the west approach area.* *Adding the constant-slope profile to Option A would result in a bridge height similar to Option L in the west approach area.*		
Wildlife Habitat	Option A would remove 11.4 acres of mostly the Urban Matrix cover type, evenly spread among all areas.	Option K would remove 19.5 acres of mostly the Urban Matrix cover type, with most in the Montlake area.	Option L would remove 10.8 acres of mostly the Urban Matrix cover type, with effects evenly distributed among the geographic areas.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would remove an additional 0.2 acre of vegetation in the west approach area.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would remove an additional <0.1 acre of vegetation in the Portage Bay area.*	*Adding the northbound capacity on Montlake Boulevard to Option L would remove an additional 0.1 acre of vegetation in the Montlake area.*
Geology and Soils	All options include designing bridge columns to withstand seismic motion, and/or excavating areas of vulnerable soils and replacing them with stronger material. Option A would have a lower risk of damage from liquefaction and long term settling than Options K or L. This is because Options K and L both have a large structure-supported interchange (SPUI) located at the Montlake shoreline.		
		The risk of damage to the below-water facilities for Option K would be greater than if the interchange were constructed above water.	

Summary of project operation and permanent effects (continued)

Element of the Environment	Option A	Option K	Option L
Hazardous Materials	Project operations would include a variety of hazardous materials (fuels, lubricants, asphalt, paint, solvents, etc.) being transported along the SR 520 corridor. Any time such materials are transported, there is a risk that they could be accidentally released to the environment.		
		Under Option K, operational restrictions on hazardous materials transport through the tunnel may be employed to minimize fire and explosion risk.	
Navigation	Under all options, the west transition span of the new Evergreen Point Bridge would be 3 feet lower than the No Build Alternative, the draw span would be removed, and the east transition span would be 15 feet higher. The changes would impose a height restriction of 70 feet for vessels passing under the new Evergreen Point Bridge. Boats with an overhead clearance of more than 41 feet would only be able to pass under the east transition span.		
	Under Option A, the new bascule bridge would coordinate openings with the existing bridge and would not pose height restrictions.		Under Option L, the new bascule bridge would coordinate openings with the existing bridge and would not pose height restrictions.

Note: Effects resulting from the suboptions are shown in italics.

Quantitative comparison of effects during project operation

The table below lists the quantifiable effects (those effects that could be estimated as measurable quantities, e.g., acres) of the 6-Lane Alternative options on each element of the environment during project operation. Additional effects resulting from the suboptions are shown in parentheses.

Quantitative comparison of effects during project operation

Element	Type of Effect	Operation Effects		
		Option A	Option K	Option L
Transportation		Please see qualitative effects summary in previous table		
Land Use and Economics	Land converted to right-of-way (acres)	11.1	15.7	11.9 (1.4)
	Full parcel acquisitions	7	6	5
Social Elements		Please see qualitative effects summary in previous table		
Recreation	Parks effects (acres)	5.55	7.55	7.05
Section 4(f) Evaluation		Extensive quantitative effects discussion can be found in the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS		
Section 6(f) Evaluation		Extensive quantitative effects discussion can be found in the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS		
Visual Quality		Please see qualitative effects summary in previous table		
Cultural Resources		Please see qualitative effects summary in previous table		
Noise	Residences where noise levels would approach or exceed the NACs – without noise walls	249	256	235
Air Quality	Local National Ambient Air Quality Standards violations	0	0	0
Energy and Greenhouse Gases	Estimated gallons of fuel (millions) consumed annually during operation (2030)	39.8	40.7	40.7
	Greenhouse gas emissions in metric tons of carbon dioxide equivalents (MT CO2e) as compared to No Build Alternative	-10%	-9%	-9%
Water Resources	Total Pollutant Generating Impervious Surface Area (acres)	77.5[a]	93.3[a]	87.0[a]

Quantitative comparison of effects during project operation (continued)

Element	Type of Effect	Operation Effects		
		Option A	Option K	Option L
Ecosystems	Wetland fill (acres)	0.1 (<0.1)	1.8 (<0.1)	0.3 (<0.1)
	Wetland buffer fill (acres)	0.7 (0.1)	5.4 (<0.1)	1.5 (<0.1)
	Wetland shading (acres)	3.2 (0.1)	2.8	4.3 (<0.1)
	Wetland buffer shading (acres)	0.9	0.1	1.3
	Wetland mitigation needed (acres)	0.2[b]	4.05[b]	0.55[b]
	Aquatic habitat filled (acres)	0.5 (0.01)	2.7 (0.01)	0.6
	Vegetation removal (acres)	11.4 (0.2)	19.5 (<0.1)	10.8 (0.1)
	Overwater structures (acres)	49.2 (2.3)	48.8	52.3
Geology and Soils		Please see qualitative effects summary in previous table		
Hazardous Materials		Please see qualitative effects summary in previous table		
Navigation		Please see qualitative effects summary in previous table		

Note: Effects that would result from adding the suboptions to the Options are shown in parentheses.
[a] Adding the suboptions to Option A, K, or L would slightly increase the amount of Pollutant Generating Impervious Surface.
[b] Wetland impacts added by the suboptions would be mitigated at the same ratio as other effects, resulting in slightly greater mitigation needs compared to the base options.

Summary comparison of effects during project construction

The table below summarizes the construction effects of the 6-Lane Alternative options on each element of the environment. Additional effects resulting from the suboptions are shown in italics. Effects from adding the suboptions to each option are noted only where they would result in a measurable difference to the effects described.

Summary comparison of effects during project construction

Element of the Environment	Option A	Option K	Option L
Transportation	All options would have similar construction effects on transportation through most of the project area, with differences in the vicinity of the Montlake Boulevard interchange. Options K and L would result in more effects than Option A because of the amount of truck traffic required for construction of the new SPUI and the traffic effects during the closure of NE Pacific Street.		
Road Closures and Detours	All options would close the Lake Washington Boulevard ramps for some period of time during construction. The ramp closures would mostly affect local street operations and are not expected to have a substantial effect on SR 520 operations. Traffic that currently uses the Lake Washington Boulevard ramps would be detoured to use the ramps at Montlake Boulevard. A number of improvements would be made to the ramps at Montlake Boulevard in order to accommodate the detour traffic. All options would close Delmar Drive E. for 9 months to accommodate construction on SR 520 beneath the bridge, as well as construction of the 10th Avenue E./Delmar Drive E. lid. Traffic would be detoured to 10th Avenue NE.		
		Options K and L would close NE Pacific Street for 9 to 12 months. During this closure, detour traffic would use the Montlake Boulevard NE/NE Pacific Place intersection (600 feet to the north) to make any turning movements. Several improvements would be made to the intersection to accommodate the additional detour traffic. Even with these improvements the intersection would operate at Level of Service F.	
Haul Routes	All options would require construction-related truck traffic on local streets. Most of the trips would use Montlake Boulevard to access SR 520. Construction-related truck traffic on SR 520 and the Montlake ramps would range from 11 to 19 vehicles per hour and would not have substantial effects on any one segment or ramp analyzed. Other arterials would be affected, and the estimated number of truck trips along these arterials would be relatively low compared to overall arterial volumes. The exception would be E. Shelby Street and E. Hamlin Street, which are residential streets in Montlake that may need to be used to access construction occurring near MOHAI.		
		Options K and L would use E. Shelby Street and E. Hamlin Street as haul routes during construction. During peak construction periods there could be as many as 5 to 20 trucks per hour, depending on which option is selected.	
Parking	All options would use the MOHAI parking lot for construction staging and would remove the five on-street parking spaces on 24th Avenue E. Museum operations would not be affected because operations would be moved prior to the start of construction. All options along with construction of the Sound Transit North Link University of Washington (UW) Station would affect available parking in the UW E-11 and E-12 lots.		

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Parking (continued)	Option A would remove 54 spaces at the UW E-11 and E-12 lots.	Option K would remove 549 spaces at the UW E-11 and E-12 lots.	Option L would remove 211 spaces at the UW E-11 and E-12 lots.
Pedestrian and Bicycles	All options would close the 24th Avenue E. bridge and the Bill Dawson Trail for most of the construction duration, leaving only Montlake Boulevard open to pedestrian and bicycle traffic. Bicycle and pedestrian access may be restricted to one side of Montlake Boulevard.		
Transit	All options would permanently close the Montlake Freeway Transit Station, relocate transit stops on Montlake Boulevard, and temporarily close the Evergreen Point Road Transit Station for 4 to 6 months.		
		Options K and L would temporarily relocate several transit stops on NE Pacific Street and Montlake Boulevard.	
Land Use and Economic Activity	Construction would occur within existing WSDOT right-of-way, adjacent to SR 520, to the extent possible. However, in some places within the project area, land now used for other purposes would be used for construction purposes. The boat slips on the south side of the Queen City Yacht Club and at the Bayshore Condominiums would be removed to accommodate construction of the Portage Bay Bridge. These moorages would be replaced after construction was completed.		
		Options K and L would relocate the UW's WAC throughout the construction duration.	
	The loss of parking near Husky Stadium could inconvenience UW Medical Center employees, event attendees, and campus visitors.		
	The positive effects of construction-related jobs, spending (e.g., project spending and spending by construction workers), and resulting sales tax revenues would be widely dispersed through the local and regional economies.		
Social Elements	All options would affect adjacent neighborhoods during construction. These neighborhoods could experience negative effects from detours, haul truck traffic, relocated bus stops, and utility service disruptions. Construction would also increase noise, dust, and visual clutter in residential, business, and park areas adjacent to construction zones. These effects could reduce residents' quality of life and limit connections to community resources, patronage at neighborhood businesses, or use of recreational amenities. Partial closures of sidewalks, bicycle paths/routes, trails, and park areas could discourage neighborhood activity and use of community resources. All options would have similar effects except in the Montlake and UW south campus areas, where the scale and intensity of construction would differ. The scale and intensity of construction-related effects within these areas would be greatest with Option K.		
	Construction would occur over a period of slightly less than 7 years.	Construction would occur over a 7½-year period.	Construction would occur over a period of less than 7 years.
		Effects on the University District and Montlake neighborhoods would be similar for Options K and L. Construction effects would include longer and more intense construction effects of noise, dust, vibration, construction traffic and visual changes due to construction of the tunnel (Option K) or new bascule bridge and SPUI ramps (Option L). Construction in this area would last 6½ years with Option K and 5 years with Option L.	

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Social Elements (continued)		Closure of NE Pacific Street associated with Options K and L could affect response times and emergency accesses to UW Medical Center.	
Environmental Justice	All options would result in disproportionately high and adverse effects on the usual and accustomed fishing areas of the Muckleshoot Indian Tribe during construction. Overwater and in-water construction would affect tribal fishing opportunities and fish habitat, although the risk of harming fish is lower for Options A and L compared to Option K.		
Recreation	All options would affect adjacent parks during construction. These parks could experience negative effects from property acquisitions, construction-related truck traffic, and construction noise and visual clutter. All options include a proposed haul route adjacent to Roanoke Park, and construction effects would last approximately 2 years. All options would affect East Montlake Park, McCurdy Park, and the University of Washington recreation facilities. The scale and intensity of construction near these parks would vary among the options, with increased noise, dust, and traffic in and around the park areas. All options would permanently close McCurdy Park and a portion of East Montlake Park. All options would also use a portion of the UW campus for construction and staging.		
	Option A would result in 5.1 acres of construction effects on area parks. This option would temporarily close over 60 percent of East Montlake Park. Construction effects are likely to last for 24 to 30 months. Approximately 1.1 acres of UW Open Space would be used for construction staging. Construction of the new bascule bridge would mainly affect access to the UW Open Space. Construction effects are likely to last 36 to 42 months.	Option K would result in 7.0 acres of construction effects on area parks. This option would temporarily close over 80 percent of East Montlake Park. Construction effects are likely to last for 54 to 60 months. Approximately 0.5 acre of UW Open Space would be used for construction staging. Construction of the tunnel would substantially affect access and parking on the UW campus, and the WAC would be dismantled and its functions temporarily relocated during tunnel construction. The WAC would be restored in its original location upon completion of construction. Construction effects are likely to last 48 months.	Option L would result in 6.3 acres of construction effects on area parks. This option would temporarily close over 80 percent of East Montlake Park. Construction effects are likely to last for 27 to 36 months. Approximately 0.9 acre of UW Open Space would be used for construction staging. Construction of the bascule bridge span, support columns, and ramps would affect access and parking on the UW campus, and cause periodic closure of the trails, the Canoe House, and the WAC. Construction effects are likely to last 36 months.
	All options would require periodic closure and detours of the Ship Canal Waterside Trail, trail access from Montlake Boulevard, trail access in East Montlake Park, and the Arboretum Waterfront Trail. The kayak and canoe launch point at East Montlake Park would also be periodically inaccessible.		

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Recreation (continued) *Suboptions*	*Adding the Lake Washington Boulevard ramps and eastbound HOV direct-access ramp to Option A would temporarily affect an additional 0.1 acre of East Montlake Park and 0.3 acre of the Arboretum during construction.*		
Section 4(f) Evaluation	Under Section 4(f), temporary occupancy of parks, recreation sites, and historic properties would occur during construction. Sites that would be affected under all options include Interlaken Park, Montlake Playfield, and the Bill Dawson Trail.		
	De minimis use of 2220 E Louisa Street residence occurs. This option permanently uses the Ship Canal Waterside Trail and the NOAA Northwest Fisheries Science Center. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS.	*De minimis* use of the Montlake Historic District and the NOAA Northwest Fisheries Science Center occurs. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS. The Ship Canal Waterside Trail would be temporarily closed during construction and no easement is required.	*De minimis* use of the NOAA Northwest Fisheries Science Center occurs. This option permanently uses the Ship Canal Waterside Trail. Suboption L uses the Pavilion Pedestrian Bridge, and the North and South Pedestrian Bridges. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS.
Section 6(f) Evaluation	Construction easements for Section 6(f) properties that last for up to 6 months (180 days) are considered temporary conversions. Construction easements lasting more than 180 days are accounted for as permanent conversion and included in the table titled “Summary of project operation and permanent effects.”		
	Option A and its suboptions would convert portions of the Ship Canal Waterside Trail, East Montlake Park, and the Washington Park Arboretum.	Option K would convert portions of East Montlake Park and the Washington Park Arboretum.	Option L and its suboptions would convert portions of East Montlake Park and the Washington Park Arboretum.
	Temporary conversion of portions of East Montlake Park and the Washington Park Arboretum would occur.	Temporary conversion of portions of the Washington Park Arboretum would occur.	Temporary conversion of portions of East Montlake Park would occur.

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Visual Quality	All options involve large-scale construction activities using heavy equipment. Vegetation removal would occur along the corridor and mature roadside trees and shrubs along both sides of SR 520 would be affected. Views from homes currently screened by these trees would then overlook ongoing construction. Construction equipment and activities would be visible from homes along roadways and surface streets. Construction activities would also be highly visible from the Seattle Yacht Club, the Montlake Cut, Montlake Boulevard, and the UW southeast campus. All in-water and upland activities associated with replacing the Portage Bay Bridge would result in substantial degradation of visual character and quality of the south part of Portage Bay. The viewers most affected would be motorists crossing the bridge, residents on houseboats near the bridge ends, park users at Montlake Playfield, and boaters at the Queen City and Seattle yacht clubs. All options would require some construction north of the Montlake Cut and would require removing specimen quality conifers in the UW Open Space. All options would require a considerable amount of earthwork for widening SR 520 and grading for the stormwater ponds, which would affect residences in the Shelby-Hamlin area and users of the Arboretum and Ship Canal waterfront trails. Construction work bridges would also clutter views, especially for boaters in the Montlake Cut and SR 520 motorists, both of whom would be sensitive to visual quality. All options include work bridges that would be highly visible at breaks in the tree line in the Arboretum. Barges and tall cranes would stand out and further diminish visual character and quality. Temporary changes to visual character and quality would be high for views from or near the west approach bridges and from Husky Stadium, where Foster Island and the Arboretum ramps are visible from seats in the northeast corner of the stadium.		
	Option A would construct a new bascule bridge across the Montlake Cut. Construction would require the removal of a band of mature, dense woods along the cut, which would diminish views. The removal of two single-family homes and vegetation would also eliminate a buffer for nearby homes. The greatest effect on views and visual quality would be due to reconstruction of the Montlake interchange adjacent to the NOAA campus and to homes along Lake Washington Boulevard. Construction in the Montlake area would last 4 years.	Option K would require extensive excavation for construction of the tunnel, SPUI, and tunnel entrances in East Montlake Park and in the south parking lot of Husky Stadium. The greatest effect on views would be from the extreme change in landform and the construction of ventilation towers for the tunnels. A temporary detour bridge south of the existing west approach would add to the clutter. This high level of degraded visual quality and character from demolition and construction could last up to 7 years in this area.	Option L would require excavation for the construction of the elevated SPUI, the depressed mainline under the SPUI, and the new bascule bridge over the east end of the Montlake Cut and associated approaches. Very high levels of change would occur at the east end of the Montlake Cut, the east Shelby-Hamlin neighborhood, and East Montlake Park area. This high level of degradaded visual quality and character from demolition and construction in this area could last up to 5 to 6 years.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would remove mature poplars and other specimen trees to the east of Lake Washington Boulevard E.*		*Adding northbound capacity on Montlake Boulevard would create additional construction views along Montlake Boulevard north of Pacific Street.*

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Cultural Resources	The construction work bridges and barges used for demolition and construction of the Portage Bay Bridge may introduce new visual effects, especially to the Kelley House, because one of the work bridges is planned to be at the current location of the Portage Bayshore Condominium docks next door. Upon completion, the work bridges would be removed and the condominium docks would be replaced. Temporary construction supports and barges used for in-water activities may occasionally interfere with the Seattle Yacht Club's marine activities in the Montlake Cut. In-water construction activities are allowed only from October 1 through April 15, so most marine activities in the cut from mid-April to the end of September would be unaffected. Historic properties in this area would experience effects from construction. All of the options would affect the Montlake Historic District with increased noise, fugitive dust, glare from lights for nighttime construction, and possibly vibration from demolition and construction. Particularly affected would be portions of the historic district in the Shelby-Hamlin area east of Montlake Boulevard, which would be affected by construction in East Montlake and McCurdy Parks and truck traffic on E. Shelby and E. Hamlin Streets. The specific effects on historic properties that may result from construction will be fully analyzed once the details of construction are further developed and more information on the potential effects is available. The Foster Island presumed Traditional Cultural Property would experience dust and construction-related noise and vibration under all options. Construction of all options would include construction work bridges on Foster Island that would be removed and construction easement property would be returned to park use after construction was completed. During construction, access to the north part of the island would be restricted, but access to this area is not as important for traditional cultural activities. For Options A and L, the majority of effects would be north of the existing SR 520 alignment and would not interfere with any ongoing cultural activities that may occur on the southern part of Foster Island, and would involve little or no ground disturbance within the known historic land area of the south island. However, because of land bridge construction south of the existing alignment, Option K would have the potential to interfere with cultural activities that may occur on the southern part of Foster Island. The degree of construction disturbance could be determined to be an adverse effect on the presumed Traditional Cultural Property. Once the final alignment is determined, additional investigation will be done to determine the formal boundaries of the presumed Traditional Cultural Property. Once specific construction effects are more clearly identified, Foster Island can be re-evaluated for potential adverse effects from construction activities.		
Suboptions			*Adding northbound capacity on Montlake Boulevard would reconstruct three existing NRHP-eligible pedestrian bridges over Montlake Boulevard, constituting an adverse effect. Construction activities could affect adjacent historic properties, including Graves Hall, Bloedel Hall, Winkenwerder Forest Sciences Laboratory, Hewitt Wilson Ceramics Laboratory, Wilcox Hall, More Hall, the University of Washington Club, and McMahon Hall; however, effects would not be adverse.*

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Noise	During construction, people living and working near construction areas would be affected by noise from a variety of activities and equipment. Construction phases that include preparing for new structure construction, roadway paving, and structure demolition would result in noise levels ranging from 83 to 94 decibels (dB) at 50 feet from the construction site. Pile-driving would be the loudest single source of noise during construction preparation. The equipment would include vibratory and impact equipment that can produce short-term noise levels of 99 to 105 dB at 50 feet. Noise levels can vary depending on the distance, topographic conditions between the pile-driving location and receiver, frequency of pile-driving, and the number of pile-drivers operating at one time. The loudest construction-related noise activities are pile-driving and demolition of existing structures. Typical construction equipment is expected to have a range of 62 to 105 dB maximum noise level 50 feet from the source. Major non-impact noise-producing equipment includes concrete pumps, cranes, excavators, haul trucks, loaders, and tractor trailers; maximum noise levels could reach up to 92 dB at the nearest residences (50 to 100 feet). State regulations restrict noise from construction activities by imposing noise limits based on the type of activity, time of day, and property type with less noise allowed for residential than for commercial and industrial receivers. Vibration from general construction can affect receivers that use vibration-sensitive equipment such as medical or scientific equipment. The only such known receiver located close to construction activities is the NOAA Northwest Fisheries Science Center, which uses floating electron microscopes in its research. Major vibration-producing activities would occur primarily during demolition and preparation for the new bridges. While pile-driving or vibratory sheet installation may occur within 50 to 100 feet of sensitive receivers, it is unlikely that vibration levels would exceed 0.5 inch per second at distances greater than 100 feet from the construction sites.		
Air Quality	Soil-disturbing activities, diesel equipment, traffic congestion, and paving with asphalt would generate emissions that may temporarily affect air quality in the vicinity of the construction activity. Engine and motor vehicle exhaust would result in emissions of volatile organic compounds (VOCs), nitrogen oxides (NO_x), particulate matter (PM_{10}, $PM_{2.5}$), and air toxics. Air quality will be most affected in areas close to the active construction sites. Depending on the option selected, the project could take up to 7-1/2 years to build, which will require the project to be evaluated for conformity with the State Implementation Plan for carbon monoxide emissions. The detailed construction emissions analysis will be completed after the preferred alternative is identified, and the analysis included in the Final EIS.		
Energy and Greenhouse Gases	Onsite construction energy requirements for Option A would be 15,006,000 million British thermal units (MBtu) and pontoon transport would be 108,000 MBtu.	Option K has the largest onsite construction energy consumption estimate of 34,299,000 MBtu, which is about double of Options A and L. Energy required for pontoon transport would be the same as Option A.	Onsite construction energy requirements for Option L would be 18,780,000 MBtu. Energy required for pontoon transport would be the same as Option A.
	During construction, the primary source of greenhouse gas emissions would be fuel combustion, with the greenhouse gas emissions being proportional to the amount of energy used and also expressed in project costs. Unintentionally released fugitive gases, such as coolant leaking from air conditioners, is not included in the analysis. The analysis assumes diesel fuel only (no electricity or gasoline) to be conservative and is intended to show relative differences between the options.		
	Option A would have the lowest level of construction greenhouse gas emissions.	Option K has the highest greenhouse gas emissions potential at roughly double that of Option A.	Option L would produce approximately 20 percent more emissions than Option A, but less than Option K.

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Water Resources	The primary concern for water quality during construction is increased turbidity in water bodies. From the land-based activities the most likely source would be from construction-exposed soils eroding during rainstorms and flowing into nearby water bodies. For water-based activities the most likely source would be from direct disturbance of sediments through activities such as pile-driving, column construction, and anchor placement. Another potential risk is spills of pollutants such as fuel and lubricants. Construction of roadways and bridges may temporarily alter the flow of groundwater but the effects are typically minimal and temporary.		
	The need for dewatering is expected to be fairly minor.	This option would require substantial excavations for the depressed SPUI with much of it likely to be below the water table. This would require substantial dewatering and the disposal of a large volume of water.	The need for dewatering is expected to be fairly minor.
Ecosystems	All of the options would create larger areas with reduced fish habitat functions, primarily due to increased shading by the work bridges and barges. All options would result in the same area of temporary overwater structure in the Portage Bay area (3 acres). Although Option L would result in the most overwater shading in the west approach area, Option K would result in the overall greatest loss of fish habitat due to the filling for the depressed SPUI. All of the options would result in noise from construction activities that could affect wildlife species, and could temporarily displace state- and federally-listed and priority bird species. Construction activities could affect wildlife by removing vegetation and wildlife habitat and increasing shading through the use of work bridges. Although, habitat quality is generally low for the Urban Matrix cover type, some urban-adapted species such as black-capped chickadees, American robins, and eastern gray squirrels would be affected. Option K would result in the greatest loss of wildlife habitat during construction.		
Wetlands	All options include construction work bridges, work platforms, staging areas, and construction access roads that would have transient effects on wetlands due to vegetation clearing or shading during the 5- to 7-year construction period. In general, Option K would have more effects on wetlands from construction than Options A and L. Option K would also result in more wetland buffer being filled and shaded during construction.		
	Option A would fill 0.6 acre of wetland and 2.8 acres of wetland buffer.	Option K would fill 1.1 acres of wetland and 3.2 acres of wetland buffer.	Option L would fill 0.5 acre of wetland and 2.8 acres of wetland buffer.
	Option A would shade 6.4 acres of wetland and 0.2 acre of wetland buffer.	Option K would shade 8.1 acres of wetland and 0.6 acre of wetland buffer.	Option L would shade 6.4 acres of wetland and 0.2 acre of wetland buffer.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would clear an additional 0.1 acre of wetland and 0.4 acre of buffer and shade an additional 0.4 acre of wetland.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would affect less than 0.1 acre of additional wetland.*	*Adding northbound capacity on Montlake Boulevard to Option L would affect an additional 0.1 acre of wetland.*

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Pile-Driving and Loss of Substrate	All options would require substantial in-water pile-driving to construct work bridges in shallow-water areas that cannot be accessed by barge. The underwater sound levels generated during pile-driving activities can disturb or alter the natural behavior and habitat of fish and other aquatic species and in some instances cause injury or mortality. Option K would require considerably more in-water and over-water construction in the Montlake and west approach areas compared to Options A and L. The depressed SPUI would be constructed below the high-water elevation of the lake. The loss of 2.7 acres of aquatic habitat is considered permanent, so it is not included in the construction effects quantities. All options would result in the loss of lake bottom substrate that supports aquatic vegetation as a result of work bridges. In addition to the work bridges, in-water construction would also include installing temporary cofferdams.		
	Option A would require 2,893 piles and affect approximately 9,090 square feet of substrate.	Option K would require 3,660 piles and affect approximately 11,500 square feet of substrate.	Option L would require 2,853 piles and affect approximately 8,960 square feet of substrate.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would require an additional 55 temporary support piles and affect an additional 170 square feet of substrate.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would require three additional in-water piles.*	
Shading of Aquatic Habitat	All options would increase shading from the work bridges and could reduce the distribution, density, and/or growth rate of aquatic vegetation in the shadow of these structures.		
	Option A would shade 10.9 acres of aquatic habitat.	Option K would shade 11.8 acres of aquatic habitat.	Option L would shade 10.3 acres of aquatic habitat.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would shade an additional area totaling less than 0.1 acre.*	*Adding the eastbound off-ramp to Montlake Boulevard to Option K would shade an additional area totaling less than 0.1 acre.*	
Loss of Wildlife Habitat	For all three options, most vegetation clearing for construction would occur in the west approach area, and Urban Matrix would be the most commonly affected habitat type. Option K would result in more clearing for construction than the other options.		
	Option A would remove 12.4 acres of wildlife habitat, composed of mostly the Urban Matrix cover type.	Option K would remove 14.9 acres of wildlife habitat, composed of mostly the Urban Matrix cover type, in the Montlake and west approach areas.	Option L would remove 14.0 acres of wildlife habitat composed of mostly the Urban Matrix cover type.
Suboptions	*Adding the Lake Washington Boulevard ramps to Option A would remove an additional 0.5 acre of habitat, mostly in the Parks and Other Protected areas cover type.*		*Adding the northbound capacity on Montlake Boulevard to Option L would remove an additional 0.2 acre of habitat, mostly in the Parks and Other Protected areas cover type.*

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Geology and Soils	All options would require excavation and grading for cuts and fills, and/or installation of bridge and retaining wall structures. Other than the depressed SPUI and tunnel for Option K, the topographic changes within the corridor would be minor. Dewatering may be required in excavations. Water quality issues could arise from needing to discharge large quantities of sediment-laden water. Dewatering may result in settlement of nearby structures if the water table level is not taken into consideration. The groundwater level is near the surface in many areas including the Arboretum.		
	Option A would result in an estimated 340,000 cubic yards (cy) of excavation and 86,000 cy fill material. The overall constructability risk based on geologic criteria for this option is a low to moderate risk.	Option K would result in an estimated 1,300,000 cy of excavation and 320,000 cy of fill material. Deep pile walls would be required for the depressed SPUI and risks from leaks and contamination or settlement of adjacent soils would be greater than the other options. The overall constructability risk based on geologic criteria for this option is moderate to high risk.	Option L would result in an estimated 450,000 cy of excavation and 52,000 cy of fill material. The overall constructability risk based on geologic criteria for this option is moderate risk.
Suboptions			*Adding northbound capacity on Montlake Boulevard to Option L may require preloading, construction of reinforced embankments, or other measures to mitigate against long-term settlement and issues associated with the Montlake Landfill.*
Sequential Excavation Method		The sequential excavation method would require ground freezing, which involves directional drilling ahead of excavation for individual freeze pipes. This method involves some risk of freeze pipe leakage or rupture into the surrounding soil.	

Summary comparison of effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Hazardous Materials	All options could encounter contaminated soil, sediment, and groundwater; create accidental spills and release hazardous materials; demolish structures that contain hazardous materials; and encounter underground storage tanks. All options would affect the following sites: NOAA Northwest Fisheries Center, Montlake 76 station, Seattle Fire Station #22, Miller Street Landfill, and sediments in Lake Washington, Union Bay, and Portage Bay		
	Option A would also affect the Exxon Mobil and Circle K stations.	Option K may also affect the Montlake Landfill through construction activities occurring within 1,000 feet of this site.	Option L would also affect the Shell Oil Products station and Village Autocare.
Suboptions			*Adding northbound capacity on Montlake Boulevard to Option L may also affect the Montlake Landfill.*
Navigation	All options would construct work bridges on both sides of the Portage Bay Bridge and would prohibit the use of recreational vessels such as canoes or kayaks in these areas during construction. All options would construct work bridges from the east shore of Montlake, across the water to Foster Island, then east of Foster Island for work on the new west approach structures. The use of recreational vessels such as canoes or kayaks would be prohibited around work bridges during construction. Vessels would have water access within the Arboretum, and on the northern shore of Madison Park. The west and east navigation channels of the Evergreen Point Bridge would have lower clearances at different times during construction. Each navigation channel would likely be closed three times for 24 hours during placement of the new transition spans and removal of the existing transition spans. During these closures there would be other openings of varying heights available. The Evergreen Point Bridge drawspan would be permanently blocked once the new pontoons were floated into place. Adding the suboptions to Options A, K, and L would result in no measurable difference in these effects.		
	Option A would require complete closure of the Montlake Cut for two 24-hour periods and two full weekends (total of 6 days) for installation of the bascule bridge.		Option L would require complete closure of the Montlake Cut for two 24-hour periods and two weekends (total of 6 days) for installation of the bascule bridge.

Note: Suboption effects are shown in italics.

Quantitative comparison of effects during project construction

The table below lists the quantifiable effects (those effects that could be estimated as measurable quantities, e.g., acres) of the 6-Lane Alternative options of each element of the environment during project construction. Additional effects resulting from the suboptions are shown in parentheses.

Quantitative comparison of effects during project construction

Element	Type of Effect	Construction Effects		
		Option A	Option K	Option L
Transportation		Please see qualitative effects summary in previous table		
Land Use and Economics	Number of jobs during peak year construction	7,683	12,620	9,526
Social Elements		Please see qualitative effects summary in previous table		
Recreation	Parks effects (acres)	5.1 (0.4)	7.0	6.3
Section 4(f) Evaluation		Extensive quantitative effects discussion can be found in the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS		
Section 6(f) Evaluation		Extensive quantitative effects discussion can be found in the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS		
Visual Quality		Please see qualitative effects summary in previous table		
Cultural Resources				
Noise				
Air Quality				
Energy and Greenhouse Gases	Greenhouse gas Emissions (MT CO2e, in millions)	1,116,000	2,541,000	1,395,000
Water Resources		Please see qualitative effects summary in previous table		
Ecosystems	Wetland fill (acres)	0.6 (0.1)	1.1 (<0.1)	0.5
	Wetland buffer fill (acres)	2.8 (0.4)	3.2	2.8
	Wetland shading (acres)	6.4 (0.4)	8.1	6.4
	Wetland buffer shading (acres)	0.2	0.6	0.2
	Lakebed substrate (square feet)	9,099 (170)	11,500	8,964
	Vegetation removal (acres)	12.4 (0.5)	14.9 (0.2)	14.0
	Overwater structures (acres)	10.9 (0.1)	11.8 (0.1)	10.3
Geology and Soils	Excavation volume (cy)	340,000	1,300,000	450,000
	Import fill volume (cy)	86,000	320,000	52,000
Hazardous Materials	Number of known hazardous materials sites likely encountered during construction[a]	6	5	7
Navigation	Montlake Cut closure duration	Approximately 6 days	No closure anticipated	Approximately 6 days

Note: Effects resulting from the suboptions are shown in parentheses.
[a] Site count does not include lakebed sediments encountered in Portage Bay, Union Bay, and Lake Washington.

How would FHWA and WSDOT mitigate for the adverse impacts of the project?

As per regulations and in collaboration with permitting agencies and tribes, WSDOT has sequenced the design process to limit environmental effects associated with the project. Steps in this process include:

- First, *avoiding* impacts to the extent possible through measures like modifying the bridge alignment to avoid sensitive resources.
- Second, *minimizing* impacts through measures like increasing the span length between bridge columns to affect a smaller area of aquatic habitat.
- Third, identifying appropriate *mitigation* measures to offset remaining project effects that cannot be avoided or minimized.

The following two tables describe the kinds of measures that have been identified to potentially mitigate for operation and construction effects, organized by environmental element. These measures are not commitments, as a final mitigation package can only be identified once a preferred alternative and design option is chosen and the specific impacts quantified in more detail.

Avoiding and minimizing impacts

Throughout the project planning process, WSDOT and FHWA have endeavored to avoid, minimize, and mitigate project effects. Specific measures to avoid, minimize and mitigate include the following examples:

- During the early screening process, WSDOT assessed the project's effects on wetlands, habitat for threatened and endangered species, federally protected parks and historic properties, residential and commercial properties, and neighborhoods.
- WSDOT ruled out a cable-stayed bridge option, as noise would have reached a larger group of neighborhoods and noise mitigating walls could not be installed on the structure.
- WSDOT proposed five lids across SR 520 to help mitigate the widening of the footprint required for the two additional lanes under the 6-Lane Alternative.
- During the mediation process in 2007 and 2008, the mediation group prepared a project impact plan to address the effects of the SR 520, I-5 to Medina project's design on Seattle city neighborhoods and parks. The project impact plan also provided a comprehensive approach to mitigating the effects of the project, including incorporating construction mitigation plans.
- In 2007 and 2008, WSDOT completed fish tracking studies near the west approach to better understand how juvenile salmonids react to the bridge structure during migration. The information gathered will help the project team refine the new bridge design to avoid and minimize effects on juvenile salmonid populations.
- In October and November 2009, WSDOT completed an in-water test pile and noise reduction study to help evaluate the noise effects of pile driving in Lake Washington and identify the best methods for minimizing noise that could affect people, fish and wildlife during construction.

For more information on how avoidance, minimization, and mitigation were considered as the range of alternatives and design options have been developed and evaluated, please refer to Attachment 8 of the Supplemental Draft EIS.

Another project element that has helped WSDOT avoid and minimize effects has been to engage the public in project planning and identifying community resources, values, and preferences. These activities include formal public scoping processes; public meetings and hearings; community briefings; community, city-sponsored and project newsletters; a project Web site; and a project hotline. As described earlier in this summary (see the section "What planning has taken place for the project, and who has been involved?"), agencies, tribes, and jurisdictions have also collaborated with WSDOT to design project elements that avoid or minimize effects.

For more information on public, agency, and tribal engagement in the project, please see the Agency Coordination and Public Involvement Discipline Report (Attachment 7 of the Supplemental Draft EIS).

Mitigation measures identified for effects during project operation

Mitigation measures identified for effects during project operation

Element of the Environment	Option A	Option K	Option L
Transportation	The design modifications that mitigate effects on traffic include number of lanes needed for on- and off-ramps, intersection configurations, and stop controls adjacent to the corridor.		
Land Use and Economic Activity	Property acquisition and relocations will be completed in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.		
Social Elements	WSDOT would implement measures to mitigate the burden that electronic tolling would place on low-income and Limited English Proficiency drivers. The Final EIS will contain WSDOT commitments for mitigation appropriate to the project effects.		
Recreation	Where park property is proposed for conversion to non-park use, WSDOT will continue to work with the City of Seattle Department of Parks and Recreation, the University of Washington, the Recreation and Conservation Office, the National Park Service, and the FHWA to identify suitable replacement property (discussed in Attachment 7 to the Supplemental Draft EIS). Mitigation may include enhancement of existing parks and recreational properties in accordance with applicable plans.		
Section 4(f) Evaluation	Upon selection of a preferred alternative, the use of Section 4(f) resources can be defined and appropriate mitigation can be determined. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS for more information.		
Section 6(f) Evaluation	Upon selection of a preferred alternative, the conversion of Section 6(f) resources can be defined and appropriate mitigation can be determined. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS for more information.		
Visual Quality	WSDOT has developed draft urban design guidelines for the project in collaboration with community members, and will continue to update and expand these guidelines as design progresses.		
Cultural Resources	Adverse effects on historic properties must be resolved through the Section 106 process and the preparation of Memorandum of Agreement. Ways to avoid, minimize, and mitigate adverse effects must be reached through consultation. Consultation with WSDOT, FHWA, the SHPO, and interested tribes would be necessary to mitigate any potential adverse effect on Foster Island.		
Noise	According to WSDOT and FHWA guidelines, noise walls would be warranted for consideration along both sides of SR 520 from the Delmar Drive E. lid to the west end of the Evergreen Point Bridge and along both sides of SR 520 from the east of the Evergreen Point Bridge to Evergreen Point Road. Between Montlake Boulevard NE and the Arboretum, the analysis indicated that noise walls would not meet WSDOT reasonableness or feasibility criteria. Options that include noise walls would meet all WSDOT and FHWA requirements for avoidance and minimization of negative effects. As noted above, all noise walls recommended in the design (with the exception of the south Arboretum wall under Option K) would meet WSDOT criteria for feasibility and cost-effectiveness.		
Air Quality	No mitigation proposed or necessary.		
Energy and Greenhouse Gases	No mitigation proposed or necessary.		

Mitigation measures identified for effects during project operation (continued)

Element of the Environment	Option A	Option K	Option L
Water Resources	All options would reduce overall pollutant loading compared with existing levels because stormwater would be treated before discharge.		
Ecosystems	Compensatory mitigation would be required for all of the 6-Lane Alternative design options. Additional information can be found in the Initial Wetland and Aquatic Habitat Mitigation Plans for the SR 520, I-5 to Medina project, which are included as Attachment 9 to the Supplemental Draft EIS. The final compensatory mitigation for the project will be a comprehensive package designed to meet the requirements of the Federal Rule on Compensatory Mitigation and to be consistent with federal and state “no net loss” policies. The project would also be designed to meet the mitigation sequencing, compensation, reporting, and monitoring requirements typically used in WSDOT projects.		
Geology and Soils	All options would be designed to WSDOT and American Association of State Highway and Transportation Officials design standards to address seismic loading, bridges, retaining walls, and other components of the project.		
Hazardous Materials	Project stormwater facilities would reduce the risk of hazardous material spills to waters of the state by collecting and treating polluted runoff from traffic operations.		
Navigation	The permanent effect of a height restriction for vessels passing under the new Evergreen Point Bridge has been minimized by increasing the new east navigation channel’s maximum vertical clearance to 70 feet, which is similar in height to the I-90 east channel bridge clearance of 71 feet.		

Mitigation measures identified for effects during project construction

Mitigation measures identified for effects during project construction

Element of the Environment	Option A	Option K	Option L
Transportation	Because final construction staging and schedules have not yet been determined, WSDOT will continue to coordinate with local and regional transit agencies regarding future transit service effects. All options would include staging plans with specific restrictions on construction methods and prescribed work times for construction to avoid peak travel periods. Various work zone management techniques may be implemented including traveler information systems, incident management systems, active traffic management, construction worker shuttle service, special event strategies, and transportation demand management. All options would include temporary capacity improvements at the Montlake Boulevard interchange to accommodate changes in traffic patterns during construction.		
		Options K and L would include temporary changes to the Montlake Boulevard/NE Pacific Place intersection to accommodate traffic during the closure of NE Pacific Street.	
		WSDOT will coordinate with the UW regarding the reduced parking availability at Husky Stadium. Specific mitigation has not been determined at this time.	
Land Use and Economic Activity	WSDOT will coordinate with business owners for alternative access and appropriate signage. The temporary loss of boat moorage at Queen City Yacht Club and the Bayshore Condominiums would be mitigated through relocation or other options to be identified. WSDOT would coordinate with the UW on the temporary relocation of functions of the WAC (Options K and L) and reduced parking availability and associated revenues at Husky Stadium lots (all options). Specific mitigation measures have not been determined at this time.		
Social Elements	WSDOT will continue to work with the project area neighborhoods to keep residents informed of project changes, and to develop neighborhood-specific measures to address anticipated construction effects. WSDOT is coordinating with the Muckleshoot Indian Tribe to identify important access points to usual and accustomed fishing areas where proposed structures would be built. There would be additional coordination to avoid construction conflicts with tribal fishers harvesting salmon in Portage Bay, Union Bay, and Lake Washington. WSDOT will work with utility service providers to prepare a consolidated utility engineering plan consisting of key elements such as existing locations, potential temporary locations, and potential new locations for utilities; to prepare sequenced and coordinated schedules for utility work; and to develop detailed descriptions of any service disruptions. WSDOT will work with affected communities to provide advance notice of any service disruptions.		
Section 4(f) Evaluation	Upon selection of a preferred alternative, the use of Section 4(f) resources can be defined and appropriate mitigation can be determined. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS for more information.		
Section 6(f) Evaluation	Upon selection of a preferred alternative, the conversion of Section 6(f) resources can be defined and appropriate mitigation can be determined. Refer to the Draft Section 4(f)/6(f) Evaluation of the Supplemental Draft EIS for more information.		

Mitigation measures identified for effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Recreation	Best management practices would be implemented to protect recreational resources from construction-related effects such as dust, vibration, glare, and accidental damage from construction equipment. Detour routes and traffic control measures would be implemented to provide access to University of Washington recreational activities. Construction closures would be timed to minimize effects during major events. WSDOT, the City of Seattle, the University of Washington, and appropriate regulatory agencies would evaluate how best to protect specimen trees and important vegetation in the Arboretum.		
Visual Quality	Per the WSDOT Roadside Classification Plan, all options would landscape areas within the right-of-way and construction easements with vegetation similar to the vegetation removed, especially along Lake Washington Boulevard, Montlake Boulevard, and through the Washington Park Arboretum. Areas disturbed during construction would be revegetated where natural habitat, vegetation, or neighborhood tree screens were removed. These places are under Portage Bay Bridge in Roanoke Park and through Montlake, in particular at the NOAA Northwest Fisheries Science Center, East Montlake Park, Foster Island, and the Arboretum. The MOHAI site and the remaining portion of East Montlake Park would be redesigned in cooperation with the Seattle Parks Department. Foster Island would require restoration including shoreline and buffer restoration (mitigation would be extensive under Option K due to the footprint required for the land bridge and associated earthen berm). Union Bay would also require revegetation for the areas where the R.H. Thomson Expressway ramps were removed.		
Cultural Resources	All options would monitor and ensure compliance with the local noise regulations for construction and equipment operations. The facades of affected historic buildings could be protected from the accumulation of excessive dirt and dust during construction, and/or they would be cleaned in an appropriate manner at the conclusion of construction. WSDOT would consult with the SHPO and/or the Seattle Historic Preservation Officer before implementing any protection or cleaning methods. All options would locate any construction sheds, barricades, or material storage away from historic properties, and would avoid obscuring the views of historic properties. Access to historic properties would also be maintained except for unavoidable short periods during construction. Under all options, to reduce or mitigate potential impacts on the Foster Island presumed Traditional Cultural Property, project engineers may be able to refine the bridge alignment to maximize geographical avoidance of the more significant portion of the island, which is south of the gap between the two historic islands and the existing SR 520 alignment. If a significant archaeological site were present on Foster Island, potential adverse effects could be avoided or greatly minimized by using sophisticated remote sensing techniques (such as ground-penetrating radar) to identify subsurface cultural features. If successful, such techniques could help WSDOT reduce the amount of excavation necessary in areas with known resources to avoid or minimize potential adverse effects to archaeological properties. Consultation between WSDOT, FHWA, the SHPO, and interested Tribes would be necessary to identify mitigation for any potential adverse effect on Foster Island.		

Mitigation measures identified for effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Cultural Resources (continued)		Every effort would be made to keep the Canoe House accessible and functioning during and after construction of the tunnel in Option K or the new bascule bridge in Option L. Every precaution would be taken to ensure that the Canoe House is not affected during construction of the tunnel or bridge by vibrations, excavations, or heavy equipment. No construction staging or storage should occur on the Canoe House property. Construction access to and from the construction zone could be provided along Montlake Boulevard westbound off-ramp to reduce the volume of construction trucks using the residential streets of E Shelby, E Hamlin, and E Park Drive East.	
Noise	WSDOT would follow state noise control regulations and other methods of mitigating noise such as limiting construction hours within 500 feet of any occupied dwelling to minimize effects on receivers. Several construction noise and vibration abatement methods – including operational methods, equipment choice, or acoustical treatments – could be implemented to limit the effects of construction. The methods used might vary in the project corridor depending on construction criteria.		
Air Quality	WSDOT would comply with procedures outlined in the Memorandum of Agreement between WSDOT and the Puget Sound Clean Air Agency for controlling fugitive dust. WSDOT encourages contractors to reduce idling time of equipment and vehicles and to use newer construction equipment and equipment with add-on emission controls.		
Energy and Greenhouse Gases	Measures to conserve energy could include limiting idling equipment, encouraging carpooling of construction workers, and locating staging and material transfer areas near work sites.		
Water Resources	WSDOT would avoid or minimize adverse effects on surface water bodies during construction by implementing water quality pollution control measures outlined in the required temporary erosion and sediment control plan; spill prevention, control and countermeasure plan; and stormwater management and pollution prevention plan; and by following permit conditions. Potential sedimentation effects during construction would be avoided through the use of appropriate construction BMPs. Erosion and sediment control measures could include mulching, matting, and netting; filter fabric fencing; quarry rock entrance mats; sediment traps and ponds; surface water interceptor swales and ditches; and placing construction material stockpiles away from streams. A temporary erosion and sediment control plan would be prepared and implemented to minimize and control pollution and erosion from stormwater. Erosion and sediment control BMPs would be properly implemented, monitored, and maintained during construction.		

Mitigation measures identified for effects during project construction (continued)

Element of the Environment	Option A	Option K	Option L
Ecosystems	All options would implement standard overwater and in-water construction and demolition BMPs in accordance with environmental regulatory permit requirements. Specific in-water construction time periods would also be established through the project permitting process to minimize potential effects of pile-driving and other in-water construction activities on aquatic species. During column and bridge construction, contractors would use BMPs (e.g., cofferdams and construction work bridges) to avoid unintentional effects on habitat and water quality. Cofferdams or other appropriate measures would be used to isolate work areas from open-water areas, particularly for concrete pouring activities, and work bridges would be used to minimize the use of barges in shallow water areas. Bibs would be used to contain falling debris during construction of the new bridge decking and demolition of the existing decking. As noted above, temporary erosion and sediment control measures and a stormwater management and pollution prevention plan would be developed and implemented. Appropriate BMPs and sound attenuation methods will be developed in coordination with the regulatory agencies, tribes, and environmental permitting processes, and implemented to minimize potential effects of pile-driving activities.		
Geology and Soils	All options would implement BMPs to prevent erosion including minimizing loss of vegetation; using erosion-control blankets and mulching; street sweeping; use of construction exits that minimize mud tracking; constructing temporary sedimentation ponds; and limiting the area exposed to runoff at any given time. Construction techniques will be used to prevent adverse effects on slope and ground stability. For dewatering this may include reinjecting the pumped groundwater between the dewatering wells and the affected facility or using construction methods that do not require dewatering. Effects from ground vibrations could be mitigated by using drilled piles or shafts instead of pile-driving; switching to a different hammer or pre-boring holes before pile-driving; and using cofferdams (for sound attenuation and sedimentation control) or bubble curtains (for sound attenuation) within water bodies.		
Hazardous Materials	WSDOT would conduct an assessment of sites where contamination may be present to identify the nature and extent of any contaminants. In addition, structures to be demolished would be surveyed to determine whether they contain hazardous building materials like asbestos, lead-based paint, and polychlorinated byphenyls (PCBs). All options would also include a comprehensive contingency and hazardous substance management plan and a worker health and safety plan to reduce potential risks to human health. A spill prevention, control and countermeasure plan and a stormwater pollution prevention plan would be prepared to prevent the release of pollution and hazardous substances to the environment.		
Navigation	Construction of the new floating bridge would be staged so that the west and east navigation channels would not be closed on the same days. A “Local Notice to Mariners” would be distributed electronically by the Coast Guard to alert local commercial and recreational boating communities of all construction-related closures in Lake Washington and the Montlake Cut. The notice would allow all potentially affected vessels time to relocate temporarily to prevent being blocked during the bridge construction period.		

Would there be unavoidable impacts following mitigation?

Many infrastructure projects—even projects that provide substantial public benefit, like this one—have some unavoidable negative effects on the natural and/or the human environment. WSDOT is strongly committed to avoiding, minimizing, and mitigating such effects whenever possible. Nevertheless, the SR 520, I-5 to Medina project would have several adverse effects that are not possible to mitigate completely. These include:

- Demolition of the existing Evergreen Point Bridge, which is eligible for the National Register of Historic Places and the Washington Heritage Register. Although WSDOT would mitigate the removal of the bridge through photo documentation and other measures, it would no longer exist after completion of the project.
- Additional fill and shading in and over habitat in Portage Bay and Lake Washington. These effects would be greater under Options K and L, which would involve wider structures within the nearshore aquatic environment to construct the new SPUI. Option K would have the largest in-water effect: a 2.7-acre wedge of fill in the nearshore area of Union Bay, just east of the Montlake shoreline. While these effects would be mitigated, the existing habitat would be altered.
- Potential elimination of a known sockeye salmon spawning location along the east shore of Lake Washington. The eastern approach of the new Evergreen Point Bridge would be built directly over this spawning area. WSDOT would enhance nearby habitat to offset the loss, but it is not possible to exactly reconstruct the spawning area.
- The visual effects of the wider roadway, larger structures, and potential noise walls. With the build alternatives, SR 520 would be considerably wider throughout the corridor and somewhat higher across the Washington Park Arboretum (except under Option K). Option L, and potentially Option A, would be lined with noise walls in most locations other than the Evergreen Point Bridge. SR 520 would look considerably different than it does today. While the new structures would include architectural treatments to enhance their aesthetics, some people would likely consider at least some of the visual changes created by the new structures adverse. Options K and L would have greater visual effects than other alternatives in the Montlake and Arboretum areas because of the new interchanges.
- The need to pay tolls to cross the Evergreen Point Bridge. If the SR 520, I-5 to Medina project is built, drivers would have to pay to use the Evergreen Point Bridge—a crossing that is free today. While drivers would be receiving a benefit in return for the payment, the toll would be a hardship for some lower-income people who are unable to use transit or take other routes.
- Effects from construction that would span a period of years, with Option K having the longest construction timeframe and Option A the shortest. The primary adverse construction effects include work bridges in Portage Bay and Union Bay, closure of the Lake Washington Boulevard ramps during construction, closure of a portion of Pacific Street under Options K and L, and closure of the Delmar Drive E. bridge. Construction of Options K and L could add cumulative construction effects to those of Sound Transit's University Link light rail station and projects proposed under the University of Washington's master plan. Early action projects that may help improve traffic flow during construction will be considered during final design. WSDOT will work with King County Metro and Sound Transit to find ways to avoid or minimize adverse effects on transit service.
- Multiple periods of construction disruption under the Phased Implementation scenario. The Montlake neighborhood would experience especially severe effects from phased implementation, with at least two distinct periods of intense construction activity—perhaps separated by years—directly affecting the community. Aquatic resources in Lake Union would also be affected more severely by phased construction, with in-water work lasting up to as much as 10 years under Option K. Construction sequencing for the full build scenario, which would overlap construction activities to reduce the total length of construction, would not be possible with phased implementation.

- More restricted navigation on Lake Washington. If the floating span of the Evergreen Point Bridge is replaced, the new bridge would not include a drawbridge. Thus, vessels taller than 70 feet would no longer be able to travel south of SR 520. This would be 5 feet higher than the current restriction on navigation south of the I-90 bridge across Lake Washington. Based on the extremely infrequent use of the SR 520 drawspan during recent years, this should not be a substantial hardship on people using the lake for recreational or commercial activities.

Other considerations and next steps

What issues are controversial?

Like most projects of its magnitude, the SR 520, I-5 to Medina project has generated controversy in several areas. WSDOT is actively working with agencies, elected officials, tribes, and members of the public to resolve these issues. The Final EIS will identify how each of these areas has been resolved. They include:

- The SR 520 mediation process did not result in a single preferred design option for Seattle, as intended, but three separate design options. Each option represents a different set of choices and priorities for moving traffic and minimizing effects on neighborhoods. A legislative workgroup, convened in 2009 under ESHB 2211 to facilitate decision-making, recommended selecting a modified 6-Lane Alternative design option, Option A+, as the preferred option. (See "Legislative workgroup findings" on page 25 for more detail about this process.) However, broad public and political consensus has not been reached in support of this recommendation.
- Several resource agencies and tribes have identified concerns with the effects of the design options considered in the Supplemental Draft EIS, as well as with effects related to potentially affected fish populations and habitat. Some of the key issues they have raised are the effects of the low bridge profiles through the west approach and the amount of in-water filling that would be required for Option K. These design features may result in difficulties with permitting the design options if modifications are not made to address agency and tribal concerns.
- Construction and operation of the project would affect access to usual and accustomed fishing areas of the Muckleshoot Indian Tribe. The multi-year construction period would also affect fish habitat in the project area. WSDOT is working with the Muckleshoot Indian Tribe to avoid and minimize impacts on tribal fishing.
- Foster Island and other nearby areas have a high probability for the discovery of archaeological sites. WSDOT has conducted geoarchaeological research and investigation to determine the historic footprint of the island; preliminary findings indicate that the new SR 520 alignment would likely run between the historic north and south islands, reducing the potential for encountering cultural resources. However, the area still holds considerable importance in light of its historic and prehistoric use, and the potential exists to encounter an unidentified site. WSDOT worked with the Department of Archaeology and Historic Preservation and the affected tribes to consult and coordinate about these issues prior to publication of the Supplemental Draft EIS, and to develop measures to be taken if cultural resources are discovered during project construction. WSDOT is also conducting ethnographic research to learn whether Foster Island could be classified as a Traditional Cultural Property.
- Despite the findings of the Governor and legislature that the 6-Lane Alternative is the best solution for the region, some controversy still exists regarding the optimum number of lanes in the SR 520 corridor. Some groups advocate for a four-lane corridor to replace only the existing number of lanes, while others support an eight-lane corridor that would expand general-purpose as well as HOV capacity.

What are the next steps?

How the project is implemented depends on its funding, which will be influenced by a number of factors. The legislature authorized tolling to fund the project in 2009 as part of ESHB 2211, but the estimated revenue from tolling alone is not sufficient to complete any of the 6-Lane Alternative design options being considered. A finance plan for the SR 520 program—another requirement of ESHB 2211—will provide a comprehensive list of all potential funding sources and estimate how much of the project's needs these sources will cover. As discussed earlier, WSDOT would prioritize construction of vulnerable structures if funds were not sufficient to build the full project.

NEPA allows lead agencies to identify a preferred alternative at the Draft EIS stage or to wait until the Final

EIS is published. As described previously, Governor Gregoire has identified a 6-Lane Alternative as the state's preference, and the legislative workgroup has recommended design Option A+ to be carried forward as part of this alternative. However, it is the co-lead agencies' responsibility under NEPA to identify the preferred alternative. This will happen in the Final EIS, after agencies, tribes, and the public have had an opportunity to comment on the choices and the legislature has considered the findings of the legislative workgroup. Based on the current schedule, the co-lead agencies expect to identify a preferred alternative for the SR 520 project in spring 2010. Should a decision be made to pursue any new design variations with significantly greater environmental effects than Options A, K, or L, they would need to be evaluated in another supplemental environmental document, which would change the project schedule.

After the Final EIS has been issued, FHWA will prepare a Record of Decision (ROD), which will document the course of action it has decided upon as the federal lead agency. The ROD will identify the selected alternative, explain the alternatives considered, and specify an "environmentally preferable alternative." It will also explain how the lead agencies plan to implement mitigation measures and conservation actions in compliance with NEPA and other laws.

Although the ROD is the conclusion of the NEPA process, it signals the beginning of project implementation. WSDOT will further develop the engineering design for the project, including additional detail on project phasing, construction staging, and construction techniques. Having a preferred design option also will allow WSDOT to develop more specific designs for mitigation measures, which will be documented in project permit applications. These designs will be prepared by WSDOT and FHWA, in cooperation with the affected jurisdictions, resource agencies, and tribes.

What permits and regulatory approvals are required?

Anticipated permits and approvals that would be required for the project, as well as regulatory processes that must be followed, include:

Federal

- Department of Archaeology and Historic Preservation: National Historic Preservation Act Consultation (Section 106)
- Environmental Protection Agency
  - Review of Corps Clean Water Act Section 404 Permit
  - Review and Rating of NEPA Document(s)
- National Park Service: Confirm Recreation and Conservation Office Section 6(f) Approval
- Tribal Nations
  - Participate in Resolution of Section 106 Impacts
  - Resolution of Impacts to Usual and Accustomed Areas
- U.S. Army Corps of Engineers
  - Section 404, Individual Permits
  - Section 10, Rivers and Harbors Act of 1899
- U.S. Coast Guard
  - Section 9, Rivers and Harbors Act of 1899
  - Private Aids to Navigation Permit
- U.S. Fish and Wildlife Service and NOAA Fisheries:
  - Section 7, Endangered Species Act Consultation
  - Magnuson-Stevens Essential Fish Habitat Consultation
  - Marine Mammal Protection Act Compliance
  - Bald and Golden Eagle Protection Act Compliance
  - Migratory Bird Treaty Act Compliance
  - Fish and Wildlife Coordination Act Compliance

State and Regional

- Puget Sound Clean Air Agency: Cleain Air Conformity Certification
- Recreation and Conservation Office: Section 6(f) Replacement Package Approval
- Washington Department of Fish and Wildlife: Hydraulic Project Approval
- Washington Department of Natural Resources: Aquatic Lands Use Authorization
- Washington State Department of Ecology
  - 401 Water Quality Certification
  - 402 National Pollutant Discharge Elimination

System
  - Coastal Zone Management Act - Shoreline Conditional Use and Variance Approval
- WSDOT: State Environmental Policy Act

Local

- WSDOT will obtain the applicable local permits from the cities of Seattle and Medina, where the project will be located.
- King County: Waste Discharge Permit/Authorization

How can I comment, and how will WSDOT communicate with the public?

The best way to be involved in project decision-making is to comment on the Supplemental Draft EIS. There are several ways to provide comments:

Attend the environmental hearing on the Supplemental Draft EIS. WSDOT will hold an environmental hearing in February 2010. It will feature exhibits on the project, team members to answer questions, and the opportunity to comment in writing, on a computer, or by talking to a court reporter. Details about this event are listed in the box on this page.

Use the Web to comment on the Supplemental Draft EIS. WSDOT has posted links to the full text of the Supplemental Draft EIS on its Web site at *www.wsdot.wa.gov/projects/SR520Bridge*. You can make comments on the Supplemental Draft EIS by e-mail at *SR520Bridge_SDEIS@wsdot.wa.gov*. The comment period ends at midnight on March 8, 2010. The comments will be compiled into a database that WSDOT staff will review. WSDOT will respond to comments in the Final EIS.

Provide written comments by mail. You can write comments and mail them (postmarked by March 8, 2010) to:

Jenifer Young
SR 520, I-5 to Medina: Bridge Replacement and HOV Project
Environmental Manager
SR 520 Project Office
600 Stewart Street, Suite 520
Seattle, WA 98101

After the comment period has closed, WSDOT will continue to keep the public informed about decision-making and opportunities for input. If you provide your name and address when you comment, we will add you to the project mailing list, which allows you to receive regular email updates. If you have no comments on the Supplemental Draft EIS but would still like to stay informed, you may join the mailing list by logging onto our Web site at *www.wsdot.wa.gov/projects/SR520Bridge* or by calling the project hotline at 206-781-3922.

Obtaining copies of the Supplemental Draft EIS. You can obtain copies of the Supplemental Draft EIS in either hard copy form or on a CD (enclosed). Printed copies may be purchased for $60, which does not exceed the cost of production. Additional CDs are available for free. Contact the project office at 206-770-3500 for either a hard copy or CD version.

Upcoming environmental hearing

Supplemental Draft EIS Environmental Hearing
Feb. 23, 2010, 5 to 7 p.m.
Lake Union Park
Naval Reserve Building - Great Hall
860 Terry Avenue North
Seattle, WA 98109

Limited free parking on site

Served by Seattle Metro bus 17 and the South Lake Union Streetcar

List of acroynms

Acronym	Definition
BMP	best management practice
CFR	Code of Federal Regulations
cy	cubic yards
dB	decibel
EIS	Environmental Impact Statement
ESHB	Engrossed Substitute House Bill
ESSB	Engrossed Substitute Senate Bill
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
HOV	high-occupancy vehicle
I-5	Interstate 5
I-90	Interstate 90
I-405	Interstate 405
MBtu	million British thermal units
MOHAI	Museum of History and Industry
mph	miles per hour
MT CO_2e	metric tons of carbon dioxide equivalents
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
ROD	Record of Decision
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SPUI	single-point urban interchange
SR 202	State Route 202
SR 520	State Route 520
SR 520, I-5 to Medina project	SR 520, I-5 to Medina: Bridge Replacement and HOV Project
UW	University of Washington
WAC	University of Washington's Waterfront Activities Center
WSDOT	Washington State Department of Transportation

Washington State Department of Transportation

U.S. Department of Transportation
Federal Highway Administration

Title VI

WSDOT ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding WSDOT's Title VI Program, you may contact the Department's Title VI Coordinator at 360-705-7098.

Americans with Disabilities Act (ADA) Information

Materials can be provided in alternative formats: large print, Braille, cassette tape, or on computer disk for people with disabilities by calling the Office of Equal Opportunity (OEO) at 360-705-7097. Persons who are deaf or hard of hearing may contact OEO through the Washington Relay Service at 7-1-1.

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